SAN FRANCISCO PUBLIC LIBRARY
3 1223 06169 3835

The Trees of San Francisco

A Plan for the Management of the City's Urban Forest

D
REF
711.479
Sa518t

PREPARED BY:

Department of Public Works
Bureau of Engineering
Landscape Architecture Section

In Conjunction With:

Department of Public Works
Division of Urban Forestry

SEAL OF THE CITY AND COUNTY OF SAN FRANCISCO

5/S

San Francisco Public Library

GOVERNMENT INFORMATION CENTER
SAN FRANCISCO PUBLIC LIBRARY

REFERENCE BOOK

Not to be taken from the Library

The Trees of San Francisco

A Plan for the Management of the City's Urban Forest

PREPARED BY:

Department of Public Works
Bureau of Engineering
Landscape Architecture Section

In Conjunction With:

Department of Public Works
Division of Urban Forestry

March, 1991

Printed on Recycled Paper

3 1223 06169 3835

City and County of San Francisco

Department of Public Works
Office of the Director

TREE ADVISORY BOARD

Board Members

Isabel Wade
Chairperson

Joan Dekelboum
Vice-Chairperson

Elizabeth McClintock
Secretary

Brian Fewer
Treasurer

Jose Eusebio

Peter Fortune

Lin Galea

Linda Liebelt

Cathy Marcum

Cheryl Rabin

Ex-Officio Members

Melvin Baker
Dept. of Public Works

James C. Cooney
Recreation and Park Dept.

Larry Costello
U.C. Extension

Joseph P. Naras
Water Dept.

Stephen Shotland
Dept. of City Planning

Past Board Members

Mary Payne
Susan Shoaf
Andrew Detsch
Harold Retler
Georgia Quinnones
Lawrence Kornfield
Karen Cancino
Robert Senna

Richard J. Evans
Director
Department of Public Works
Room 260, City Hall
San Francisco, CA 94102

April 16, 1991

Dear Mr. Evans:

On behalf of the Tree Advisory Board, I am very pleased to submit the urban forest management plan, Trees of San Francisco. The plan has been developed over the last two years in a combined effort between the Department of Public Works (both the Urban Forestry Division and the Landscape Engineering Section) and the Tree Advisory Board. We believe it will provide an excellent framework for both policy and practice in regard to the City's street trees.

The Tree Board would like to commend the Department of Public Works staff for the attention paid to this project. In Urban Forestry, Mel Baker, Dan McKenna, Jim McGee, and Carrie Durkee all undertook the various tasks involved in the research and development of the plan with enthusiasm and dedication. In Landscape Engineering, John Thomas has done an exceptional job in writing the plan and in his presentations at the public hearings. Finally, we are particularly grateful for the support and commitment toward this effort shown by the Bureau of Street Cleaning and Urban Forestry Superintendent, John Roumbanis.

We did host the required public hearings; in fact, we held two additional hearings to ensure adequate public commentary. I believe the presentation that was developed for the hearing would be of interest to the Mayor and the Board of Supervisors since this is the first time we have an idea of what the state of our urban forest is in San Francisco and a plan for its improvement.

Thank you for your assistance and support.

Sincerely,

Isabel Wade

Isabel Wade, PhD
Chairperson
Tree Advisory Board

cc: Rudolf Nothenberg
John Roumbanis

(415) 695-2014 Room 260, City Hall San Francisco 94102

TABLE OF CONTENTS

Foreword v

Introduction vii

1. Background and History 1

2. Goals and Objectives 7

3. Planning Considerations 15

    Environmental Factors 17

4. Tree Management Plan 27

    Trees for Streets: General Guidelines 30
    Design Guidelines for District Streets 35
    Design Guidelines for Major and Secondary Thoroughfares 41
    Recommendations for Major and SecondaryThoroughfares 45
    Recommendations for Downtown Streets 128
    Trees for Site Development. 144
    Urban Forestry Districts 148
    Landmark and Distinctive Trees 226

5. Plan Implementation 229

Appendices

A. Glossary 255
B. San Francisco Tree Matrix 258
C. Urban Forestry Codes 276
D. Department of Public Works Standard Specifications 296
E. Resources Guide 308
F. Bibliography 311
G. Acknowledgments 312

FOREWORD

"Where one builds, one plants trees." Turkish proverb

This simple Turkish proverb succinctly describes the profound attachment people have with trees. Trees, along with buildings, streets and human beings, are the most prominent physical features of the urban environment. Nevertheless, the place of the tree in San Francisco's urban landscape has often been the subject of debate. Some of the City's districts, such as the Sunset and the Excelsior, have few trees, and trees on private property or in public rights-of-way are occasionally damaged by excessive pruning or removed. On the other hand, neighborhoods such as Pacific Heights or the Buena Vista District have extensive tree plantings, and the forested lands of Golden Gate Park, the Presidio and the central hills are sacred. The Trees of San Francisco seeks to define an urban forestry program which responds to the City's unusual requirements for, and attitude toward the urban forest.

Several factors contribute to the difficulty of adopting a conventional urban forestry program - characterized by dense plantings of large spreading shade trees - in San Francisco. The City's often cool, windy and foggy maritime climate, varied topography, and narrow building setbacks require an urban forestry approach which is highly selective in its tree species selection and tree placement, particularly with street trees. San Francisco's urban forest must be adapted to the City's climate, respect its citizens' right to acceptable levels of sunlight and preserve panoramic vistas, while drawing on the City's unique geographical and cultural features to evoke poetic landscapes. The Trees of San Francisco establishes design guidelines and maintenance procedures which promote tree plantings that shall be cared for and loved by the City's residents because of their horticultural appropriateness, usefulness and aesthetic character.

Digitized by the Internet Archive
in 2014

https://archive.org/details/treesofsanfranci1991sanf

INTRODUCTION

THE TREES OF SAN FRANCISCO: A Plan for the Management of the City's Urban Forest provides for long-range planning and coordination of the City's various tree planting and maintenance programs. The Department of Public Works, Division of Urban Forestry shares the responsibility for the planning, planting and maintenance of the City's trees with twenty-eight other public and non-profit agencies, each with varying degrees of responsiblity. The Plan presents a comprehensive approach these agencies can use to perform their duties in a coordinated and cohesive manner. It will also serve as a tool to promote urban forestry by guiding interested citizens, civic leaders and City staff in implementing open space and street beautification projects.

The City and County of San Francisco has certain conditions requiring special evaluation in the development of the Plan. High residential and commercial densities underscore the need for tree plantings which effectively complement the built environment. Narrow building setbacks, however, as well as an often cool, foggy and windy coastal climate, limit the number of appropriate species, especially for street tree plantings. In addition, the City's outstanding architectural heritage, dramatic vistas, and distinctive districts and neighborhoods required careful consideration in the development of recommendations for the City's urban forest.

This publication is organized into five chapters which describe in depth the character of the City and provide direction for implementation and management of the Plan. Their contents are briefly described below.

The forested headlands of the Presidio form a green gateway to the Pacific.

The first chapter, Background and History,

- describes the evolution of urban forestry in the City and addresses the circumstances from which the need for a tree management plan arose.

The second chapter, Goals, Objectives and Policies,

- sets forth the framework and guidelines for establishing a comprehensive tree management program.

The third chapter, Planning Considerations,

- discusses the environmental and urban form factors which are the basis of the tree selection process.

The fourth chapter, Tree Management Plan,

- establishes design guidelines for district streets, and major and secondary thoroughfares.

- makes tree recommendations for all the City's major and secondary thoroughfares and downtown streets.

- describes the urban form of the City's 16 districts and makes general tree recommendations for improving each district's aesthetic character.

- establishes design guidelines for the use of trees in site development, with emphasis on lands under public jurisdiction.

- endorses the enactment of the Landmark Tree and Distinctive Tree designations.

The fifth chapter, Plan Implementation,

- describes urban forestry field practices, standards and specifications, and their inter-relationship with management procedures.

- describes current administrative procedures and recommends ways of ensuring that the Plan is integrated into the public planning process and kept up-to-date.

1. BACKGROUND & HISTORY

BACKGROUND AND HISTORY

Initial Tree Plantings: Parks, Boulevards, and Open Space

The vegetation native to the northern tip of the coastal peninsula later known as San Francisco consisted primarily of low-growing shrubs and ground covers adapted to the locale's predominantly sandy soils, maritime climate and strong coastal winds. These environmental conditions discouraged human settlement by both indigenous Indian tribes and Spanish expeditions. Shortly after establishing a presidio and mission in 1776, the Spanish described the area as "the very worst place (for settlement) in all California... since the peninsula afforded neither lands, timber, wood, nor water, nothing but sand, brambles, and raging winds."

It was not until the Gold Rush in 1849 that San Francisco's weather and lack of natural resources no longer deterred the formation of a civil township. Unfortunately, the rapid formation of a seaport town with a population of 50,000 people decimated the existing native tree cover; the few stands of Coast Live Oak and California Buckeye were quickly cut down for firewood by the newly-arrived immigrants.

The ambitious goal of establishing an urban forest from scratch despite San Francisco's unfavorable horticultural environment was set forth by the City's Board of Supervisors in the 1870's. The keystone of the tree planting effort was to be the creation of Golden Gate Park, fashioned in the tradition of the great pleasure parks of Europe and the eastern United States. Fredrick Law Olmstead, acclaimed for his design of New York's Central Park, was chosen to select a site. After visiting San Francisco, he warned, "It would not be wise nor safe to undertake to form a park upon any plan which assumed as a certainty that trees which would delight the eye can be made to grow near San Francisco." In spite of Olmstead's admonition, the Park's present location was selected in 1871, and William Hammon Hall appointed as its first Superintendent. The task of transforming the shifting sand dunes that comprised the western two-thirds of the park into a verdant pastural landscape was a monumental and complex one. Wind-blown dune sands were stabilized with successional plantings of barley and lupine before trees were

planted. Three pioneer trees were planted throughout the Park: Monterey Cypress (Cupressus macrocarpa), Monterey Pine (Pinus radiata), and Blue Gum (Eucalyptus globulus). Tolerant of salt winds, poor soils and summer drought, these trees and other related species have become the backbone of San Francisco's urban forest in all of the City's most notable open space areas, forming windbreaks that create more favorable microclimates for a wide variety of trees and shrubs.

The remarkable achievement of establishing extensive tree plantings on reclamated dune sands in Golden Gate Park inspired major forestry efforts in other parts of the City during the latter part of the 19th century. The woodlands and parkways we enjoy today, such as the Presidio, Pine Lake Park, Lincoln Park, Buena Vista Park, the Panhandle, Sunset Boulevard and Park Presidio Boulevard are a legacy of this period.

The City's Urban Forest Today

Trees on Public Lands

Most of the trees in San Francisco's parks and open spaces were planted as part of the great urban forestry efforts undertaken around the turn of the century. Consequently, a primary concern of public agencies charged with the management of this hundred-year-old forest is its declining vigor. The Recreation and Open Space Element of the City's Master Plan states, "A major reforestation effort should be undertaken in many of the larger parks, on other city properties and some major streets." In 1980, the Recreation and Park Department developed a

The thousands of trees planted a century ago in the City's parks and open spaces are in a state of decline.

Golden Gate Park Forest Management Plan, and initiated in 1982 a Tree Assessment Program designed to evaluate the hazard potential of individual trees in urban parks. At the federal level, the Army has developed a reforestation plan for the Presidio which aims to plant 100,000 trees by the year 2010. Ambitious, well-documented plans based on sound urban forestry practices will be required to renew the forests established a century ago by San Francisco's earliest citizens.

Street Trees

Street trees play a vital role in San Francisco's urban forest. Compared to the National Park and Recreation standard of 10 acres of open space per 1,000 residents in cities, San Francisco has only 5.5 acres per 1,000 residents. A broadly based street tree planting effort would partially compensate for the City's inadequate amount of public open space lands.

Unfortunately, as recent as 1950, few streets in the City were lined with trees. Since that time, a coalition of public and private organizations have actively campaigned for, planted and/or maintained street trees throughout the City.

Plane and Cypress trees on Geary Blvd. Street trees are a major element of the City's urban forest, especially in districts with limited open space.

In 1955, a Board of Supervisor's ordinance established the Tree Planting Division within the Department of Public Works to create a street and sidewalk planting program. In conjunction with San Francisco Beautiful, a community group comprised of private citizens, the Division initiated programs promoting street tree plantings. One such effort was the demonstration planting installed along Funston Drive to assist homeowners with tree selection. Financial assistance was provided by downtown business interests such as the Chamber of Commerce, who sponsored "Plant a Tree Week". An estimated 100,000 street trees were planted between 1959 and 1974 as a result of this program. In addition, Mayors George Christopher and Joseph

Alioto actively promoted the street tree planting program.

DPW's Street Planting Division's activities increased and diversified as City government responded to the ground swell of public interest in street trees. The Division's first Supervisor, Brian Fewer, introduced innovative maintenance practices and experimented with new tree species to meet the challenge of a growing and expanding urban forest. The Division of Urban Forestry, as it is now called, presently maintains approximately 22,000 trees in public rights-of-way, over four times the 5,000 trees maintained when the Division was created in 1955. In addition, the Division maintains the tree permit system for all other privately held street trees.

In 1986, a new Urban Forestry Ordinance was passed by the Board of Supervisors, superceeding the 1955 Ordinance. The updated ordinance encourages new tree planting in San Francisco, protects existing street trees, and requires the Division of Urban Forestry to review and make recommendations regarding street tree plantings associated with site development. The Ordinance also established the Tree Advisory Board, which advises the Director of Public Works on urban forestry issues.

Trees on Private Properties

Residential property owners are stewards of a small but vital portion of the City's urban forest.

Since 1981, the majority of new street tree planting projects have been coordinated by San Francisco Friends of the Urban Forest (FUF), a private non-profit organization. FUF currently assists neighborhood groups in planting approximately 1,500 trees each year.

The planting and maintenance of most of the City's street trees, as well as all trees on private property, is the responsibility of the owner of the abutting property.

Consequently, the individual property owner plays a crucial role in the maintenance and development of San Francisco's urban forest. A goal of The Trees of San Francisco is that the owners of these privately-held lands will see themselves as stewards of a small but significant portion of the City's urban forest, and be encouraged to plant and maintain appropriately selected trees on their property, especially in sidewalks, parking lots or yards fronting the street.

2. GOALS & OBJECTIVES

GOALS AND OBJECTIVES

The following goals and objectives have guided the preparation and provided the framework of this Plan. It, in turn, sets forth policies and makes recommendations for implementation that will assist in the achievement of a richly planted and viable urban forest.

Urban Forest Goals:

1. To establish a full complement of trees enhancing San Francisco's geography, architecture, districts and views.

2. To improve the local and regional environment by maximizing the benefits of the urban forest, which include: air quality improvement, light and sound filtration, microclimate amelioration and reduced water run-off and atmospheric carbon dioxide (CO2) levels.

3. To ensure the long-term sustainability of San Francisco's urban forest and protect the City's economic investment in its trees through reforestation and proper management.

4. To contribute to San Francisco's social, cultural and economic vitality by enhancing streetscapes at entry points, major thoroughfares, commercial districts and scenic locations.

5. To establish high maintenance standards for public and private trees.

6. To promote public awareness of the value and proper care of trees and increase public involvement in community forestry efforts.

7. To assure sustained funding of community forestry efforts and increase availability of resources to support them.

Objectives in Achieving Goals

Goal 1: Forestation

1. Plant a minimum of 5,000 street trees annually through a partnership of citizens and government agencies.

2. Utilize The Trees of San Francisco as a guide to street tree planting on neighborhood streets in choosing appropriate species for the cultural and environmental conditions of the site.

3. Implement recommendations of The Trees of San Francisco for the City's major and secondary thoroughfares.

4. Complete planting on all streets under the Department of Public Works' jurisdiction.

5. Actively plant in neighborhoods where street and/or off-street trees are lacking.

6. Strengthen enforcement of City laws pertaining to planting new street trees. Develop programs and policies to encourage/mandate the planting of street trees when properties change ownership.

7. Require tree planting and landscaping in all parking lots within view of public rights-of-way.

8. Coordinate planting at new or rehabilitated facilities with appropriate City agencies to assure proper tree species selection and installation.

Goal 2: Environmental Benefits

1. Plant species well-adapted to local site conditions.

2. Plant large trees whenever possible to improve air quality, reduce carbon dioxide emissions, provide bird habitats, filter noise and reduce wind.

3. Monitor tree pest and disease problems and take curative measures.

4. Plant diverse species to reduce widespread disease and insect problems.

5. Encourage planting of orchards and fruit and nut trees in community gardens and on private property to provide a food source for humans and wildlife.

6. Institute a xeriscape (low-water use) approach to publicly-maintained landscape areas (e.g. replace lawns in street medians with mulches and drought-tolerant ground cover).

7. Recycle tree and landscape residues to reduce landfill requirements.

Goal 3: Reforestation and Management

Reforestation

1. Replace each tree removed with at least one new tree.

2. Stagger removal of old and declining trees on publicly maintained streets to ensure continuous vigor and health and avoid wholesale replacement.

3. Disallow removal of healthy, appropriately selected street trees causing minimal sidewalk damage. Require suitable replacements for trees removed due to severe sidewalk damage.

4. Require replacement by size for trees removed due to construction, remodelling or new development. If tree placement is not feasible, require the property owner/developer to contribute to the Department of Public Works' Tree Fund.

Management

1. Develop and maintain a comprehensive inventory of publicly maintained street trees. Use it to schedule work programs and generate annual budgets for planting and maintenance.

2. Concentrate maintenance resources on activities offering the most benefit to the urban forest's long-term health.

3. Remove street trees in accordance with the tree removal criteria developed jointly by the Department of Public Works Urban Forestry Division and the Citizens' Tree Advisory Board. Follow removal policies established by the City's Street Tree Ordinance (1986) for public notice and hearing.

4. Institute a landmark tree program and enforce protection of all such designated trees.

Goal 4: Urban Design

1. Strengthen the City's overall aesthetic character for residents and visitors with extensive, coherent planting along major thoroughfares.

2. Enhance the City's urban form with special plantings at major nodes and entry points.

3. Promote and protect large-scale tree plantings that define districts and serve as landmarks.

4. Enhance the character and economic viability of commercial districts with distinctive plantings.

5. Promote the use of neighborhood streets and stairways as recreational environments with tree plantings and attractive landscaping.

6. Contribute to the social and cultural vitality of San Francisco by encouraging community participation in urban forestry efforts.

Goal 5: Maintenance Standards and Practices

1. Perform all tree work in accordance with standards and practices established by the Western Chapter of the International Society of Arboriculture.

2. Provide expert training for all City urban forestry personnel. Encourage their participation in the arborist certification program of the Western Chapter of the International Society of Arboriculture.

3. Require evidence of certification for tree maintenance contractors operating within the City and County of San Francisco.

4. Require PG&E to notify the Division of Urban Forestry of intention to prune City trees so the Division can elect to undertake either the pruning or its supervision. Provide PG&E with required pruning standards.

5. Schedule maintenance on cycles established by species history and as determined from an inventory program.

6. Assist tree maintenance and public education programs for community groups.

7. Distribute educational materials to property owners defining their maintenance responsibilities and describing horticultural techniques and arboricultural services.

Goal 6: Public Education

1. Undertake an active program of community outreach and education.

2. Promote the introduction of an urban forestry curriculum in public schools.

3. Support private efforts and public programs to educate the public and involve it in the protection and enhancement of the City's urban forest.

Goal 7: Funding

1. Allocate sufficient agency funds to properly maintain trees on public lands.

2. Investigate funding alternatives for maintenance such as a citywide forest assessment district.

3. Pursue public and business contributions to the Tree Fund of the Department of Public Works, Recreation and Park and Friends of the Urban Forest.

4. Seek state and/or federal funding for special projects such as tree inventories or major tree plantings.

5. Reduce tree purchasing costs by contract growing with commercial nurseries or publicly sponsored programs such as the Horticulture Program of the S.F. Sheriff's Department.

6. Reduce tree planting costs by using community skill-development programs (e.g. the Tree Corps Program of the S.F. Sheriff's Department).

3. PLANNING CONSIDERATIONS

PLANNING CONSIDERATIONS

The development of The Trees of San Francisco required careful consideration of several environmental factors. These considerations are described below.

Environmental Factors

The selection of horticulturally suitable tree species is based on a careful evaluation of environmental conditions. Environmental factors discussed in this section include climate (and microclimate), topography, and soils. Since each planted tree represents a considerable investment in time and money, it is essential that each factor be carefully analyzed early in the planning process.

Geographic Location

The environmental factors which occur in San Francisco are, in part, the consequence of its geographic location (Figure 1). In

FIGURE 1

early geologic times, rivers flowing out of the Sierra Nevada formed a gorge in a low point along the Coastal Range. With the end of the last ice age, the sea level rose, flowed through the gorge and flooded an inland valley to create San Francisco Bay. The City and County of San Francisco lies at the northern tip of a peninsula at the 38th parallel, surrounded by the Pacific Ocean and the San Francisco Bay. This location has given rise to unique weather patterns described below.

Climate

The City is located at the convergence of constantly active continental and oceanic air masses. The climate is typically Mediterranean and varies from cool winters, when virtually all the annual rainfall occurs, to cool, foggy summers devoid of rain. This climatic pattern is also found in central Chile, southwestern Australia, the Cape of South Africa, and the Mediterranean Sea Basin.

In spring, the Alaskan and Pacific high-pressure systems begin returning to their summer locations, bringing an end to the winter storms. At the same time, the longer days and higher path of the sun warm the land surfaces with the inland valleys gaining more heat than the coastal hills. The warmer air rises and creates a local low-pressure zone, and the cooler, moist marine air moves in from the Pacific, passing through the Golden Gate and over the San Francisco Peninsula. This daily pattern of air movement produces summer fog and wind in most parts of San Francisco.

In fall, as the temperature difference between the ocean and land masses decreases, the fog disappears and the City experiences its warmest season. As the coastal high pressure continues to move south, transoceanic storms begin to pass over the Bay Area. Most of San Francisco's average of 21 inches of annual rainfall occurs in the winter months between November and February.

Sunset's New Western Garden Book divides the western United States into 24 climate zones. San Francisco falls entirely into Zone 17, which is dominated by the marine influence and rarely suffers frost.

The City's hills and valleys create variations in the general climate pattern which are referred to as microclimates. More rain and fog occur in the areas close to the coast such as the Richmond and Sunset Districts. Less rainfall occurs in the Western Addition, Central and Bernal Heights Districts than in the Mission, which is in the rain shadow of the City's central hills.

The climate map (Figure 2) delineates three climate zones. These zones indicate climatic conditions in various areas of the City, and are determined primarily by wind and fog patterns. In addition, specific site conditions may create microclimates with varying wind and sun/shade characteristics. Northern and eastern building exposures receive more shade and require a different plant palette than exposures on the south and west. The taller the structure, the more the condition is intensified. The south and western sides receive sun and provide reflected heat, enabling the growth of semi- tropical plants in some cases. Similarly, topography can create special microclimates within a district. For instance, western hillside slopes tend to receive more wind and fog than the more sheltered eastern slopes.

Tolerance to salt spray should be considered in plant selection for all districts bordering either bay or coastal shorelines.

The three climate zones include the following districts:

Zone 1 (Fog Belt)

Richmond
Sunset
Ingleside (west)
Lake Merced

Zone 2 (Transition)

Marina
Western Addition
Buena Vista
Central
Excelsior (west)
Ingleside (east)

Zone 3 (Sun-Belt)

Northeast
Downtown
South of Market
Mission
Potrero
Bernal Heights
Excelsior (east)
South Bayshore

Topography

One of the unique features of San Francisco is its varied topography. Within its 49 square miles, the City rises from sea level to an elevation of 927 feet atop Mount Davidson, which lies in the geographic center between the Pacific Ocean and the San Francisco Bay. There are many other hills throughout the City between 200 and 400 feet in elevation that are distinct topographic and district features (see Figure 3). Depending on geographic location, the north and western slopes of these hills experience in varying degrees the brunt of winter storms and summer fog. In addition, these slopes may receive higher annual rainfall than the southern and eastern leeward slopes. South and east-facing slopes are also better sheltered from westerly ocean winds and fog and receive a greater amount of sun. Winds also tend to be greater on east-west than north-south streets, where buildings act as windbreaks. Microclimates can change dramatically within a small area due to these widely varying conditions and must be considered when selecting trees.

Soils

The City of San Francisco is underlain by four dominant geologic sediments from the Pleistocene and Cretaceous ages. These sediments are overlain by dune sand, Alluvium, Marine and marine terrace deposits (see Figure 3). Well into the twentieth century, winds carried the sands of Ocean Beach inland, creating extensive shifting sand dunes. These sandy soils, most commonly found near the coast, are low in nutrients and water retention. Dune sand primarily occurs in the following districts: Richmond, Sunset, Western Addition, Downtown and the Mission.

Alluvial deposits occur primarily in the South Bayshore, North-

east and Central districts. The alluvial soils are a combination of loam, clayey-loam and interspersed clay-loam. They are typically deep soils with good drainage.

Pleistocene marine and marine terrace deposits are overlain by the Colma Formation, which is primarily loam and clayey-loam. This formation occurs in the Lake Merced, Ingleside and Marina districts. These soils are typically rich in nutrients and well-drained.

Buena Vista, Central and Excelsior districts are underlain by the Franciscan formation. This parent material is composed of sandstone, shale, chert and conglomerate, and is found on Twin Peaks, Mount Davidson and San Bruno Mountain. Outcroppings occur on Pacific Heights and Telegraph, Russian and Nob Hills. Franciscan soils are usually well-drained but shallow.

A formation of Mesozoic ultra basic intrusive rocks composed of serpentine are found along a shear zone that traverses the City from northwest to southeast. Serpentinite has low fertility and low structural stability. A limited number of plants are adapted to this sterile soil.

While geologic descriptions provide accurate information about the parent soil material, the upper layers of soil usually reflect the activities of human society. Soils in an urban area may contain bricks, concrete rubble, and other debris resulting from building or street construction. There may be imported fill completely unlike the natural soils of the site, or no soil at all due to cuts made for road or building construction. Valid information will come only from an evaluation of the soil type at each planting site. For a modest fee, a soils analysis by a certified soil testing lab can determine existing soil characteristics and recommend the type and amount of amendments required to improve its texture and nutrient levels.

CLIMATE

LEGEND

■ ■ ■ CLIMATE ZONE BOUNDARY

ZONE 1 COASTAL (FOG BELT)

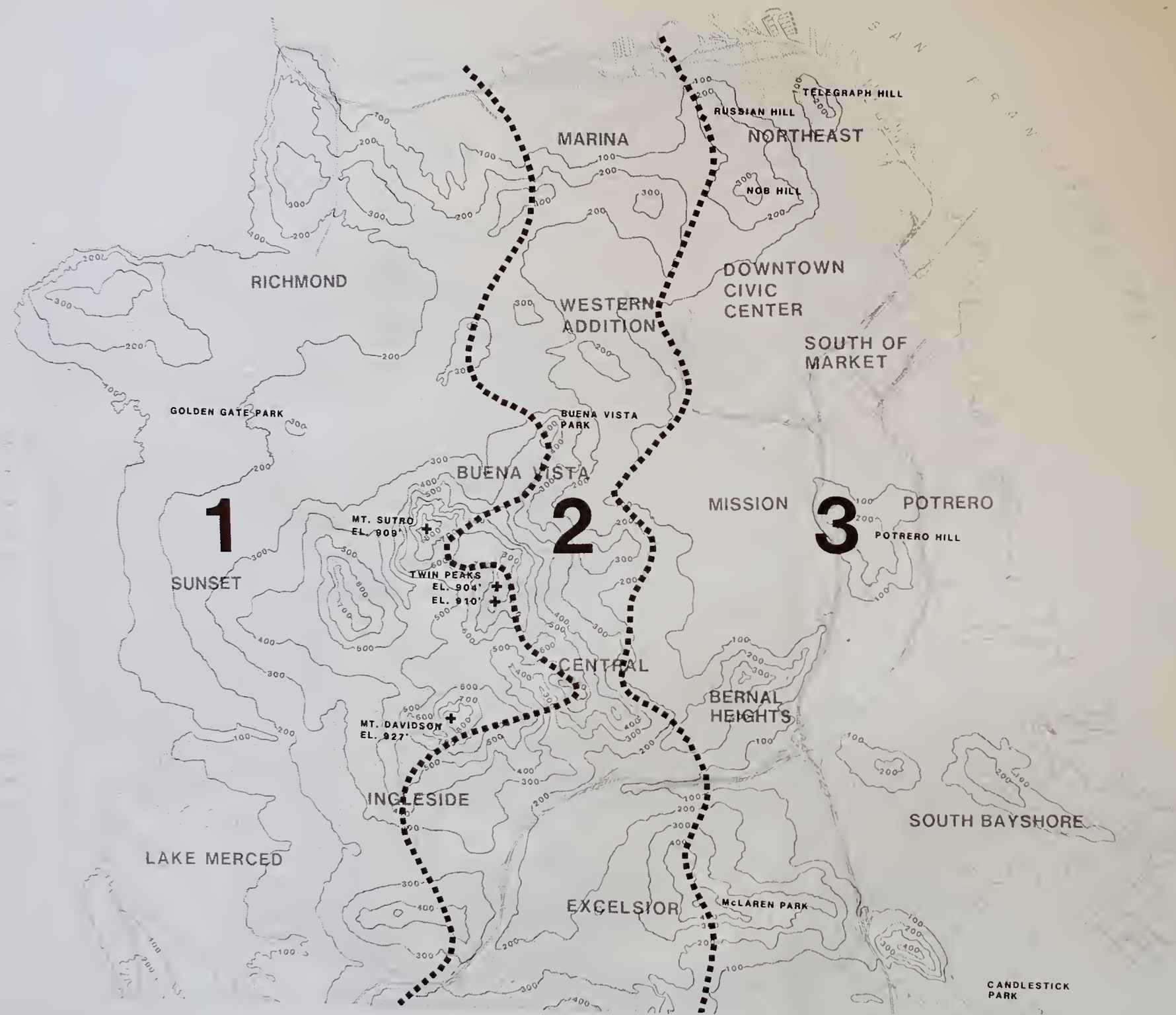
COOL TEMPERATURES, DENSE SUMMER FOG, SALTY AIR. PREVAILING WESTERLY WINDS WEST OF THE MOUNTAIN SLOPES. MARINE INFLUENCE STRONGEST ALONG COASTLINE (ZONE 1A), DIMINISHES INLAND (ZONE 1B).

ZONE 2 TRANSITION

COOL TO MODERATE TEMPERATURES. LIGHT FOG TO CLEAR, SUNNY SKIES. WINDS DIMINISH EAST OF THE MOUNTAIN SLOPES.

ZONE 3 BAY (SUN BELT)

WARM TEMPERATURES, NOTABLY IN THE MISSION DISTRICT. DRY, CLEAR, SUNNY SKIES. LIGHT TO HIGH WINDS.



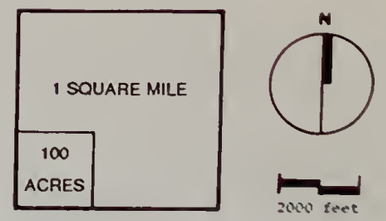


Figure 2

SOILS/TOPOGRAPHY

LEGEND

- ELEVATION
- ROCK
- INTERSPERSED CLAY/LOAM
- CLAYEY LOAM
- LOAM
- SANDY LOAM
- SAND
- BAYFRONT SOILS

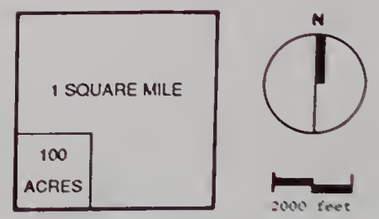


Figure 3

4. TREE MANAGEMENT PLAN

THE TREE MANAGEMENT PLAN

Within a geographic framework established by the urban forestry districts, The Tree Management Plan recommends the work to be done on the City's streets and publicly-held lands. Generic design guidelines governing all street tree plantings are provided, as well as guidelines addressing issues pertaining to major thoroughfares and residential streets. Each major and secondary thoroughfare, as well as primary streets in the Downtown area, has received species-specific tree recommendations. (See the San Francisco Tree Matrix in the Appendix for species descriptions.)

This chapter also addresses the uses of trees in off-street areas, with an emphasis on lands administered by public agencies. Finally, Landmark Tree and Distinctive Tree designations have been developed.

The principal sections of the Tree Management Plan chapter begin on the following pages:

Trees for Streets: General Guidlines 30

Design Guidelines for District Streets 35

Design Guidelines for Major and Secondary Thoroughfares 41

Recommendations for Major and Secondary Thoroughfares 45

Recommendations for Downtown Streets 128

Trees for Site Development 144

Urban Forestry Districts 148

Landmark and Distinctive Trees 226

TREES FOR STREETS: GENERAL GUIDELINES

Introduction

The lattice of street trees forms the skeletal framework of the urban forest. It can dramatically influence the quality of our everyday experience, shaping our perception of home, neighborhood, district and city.

"Trees for Streets" addresses the general design and planning considerations for all street trees, and establishes design guidelines for district streets and the City's major and secondary thoroughfares.

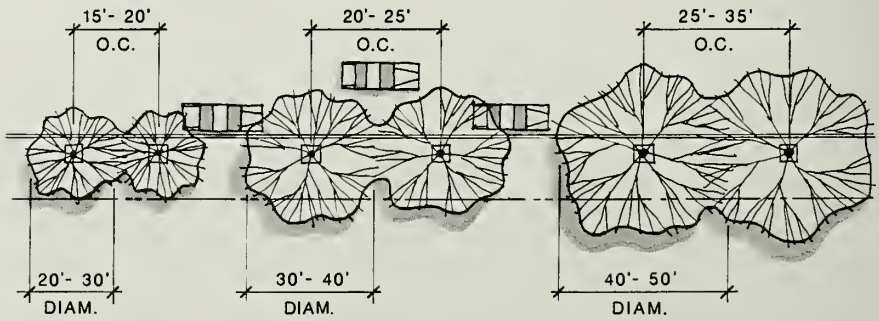
Spacing

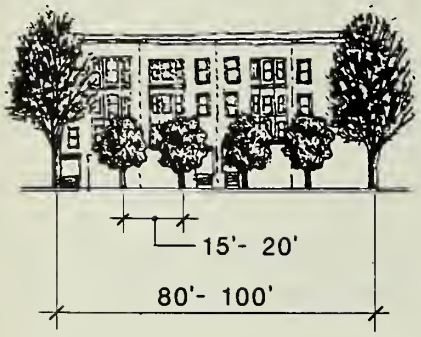
For best effect, small trees should be spaced 15 to 20 feet on center to create a virtually continuous canopy.

Medium to large trees need not be spaced for canopy overlap. Spacing will be determined by the designer's aesthetic intent. If the view from the road is the primary design criterion, medium to large trees may be spaced as far apart as 60' and still achieve the appearance of a continuous canopy. Closer tree spacing is generally recommended on streets with high pedestrian usage, when tree placement is related to the architectural form of adjacent buildings, or on major or secondary thoroughfares. Imposed factors such as the frequency of driveway cuts, underground utilities, signs, light and telephone poles, and other streetscape elements will, of course, alter the desired center spacing.

If canopy overlap is desired, spacing for various tree canopy diameters are recommended as follows:

20'-30' diameter ..... 15'-20'
30'-40' diameter ..... 20'-25'
40'-50' diameter ..... 25'-35'





When combining medium or large trees with small trees, the spacing between the larger trees may increase to allow for longer uninterrupted plantings of the smaller trees.

Solar Access

In 1978, the California Legislature passed two bills pertaining to solar access: The Solar Rights Act AB 3250 and Solar Shade Control Act AB 2321. The latter prohibits planting vegetation which will block solar radiation from reaching solar collectors meeting specific qualifications. Trees existing prior to the solar collector are exempt from this law, as are equivalent replacements for those specific trees. In addition to solar access for solar collectors, passive solar heating should be a consideration when selecting trees, especially on southern and western building exposures.

Sub-Sidewalk Basements

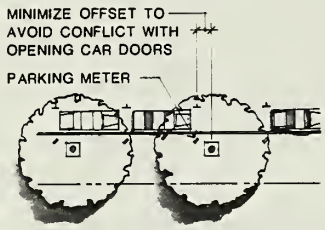
Sub-sidewalk basements are often found in certain districts of San Francisco, notably Chinatown and Downtown. Since street trees can be planted above sub-sidewalk basements only with careful consideration of drainage and structural engineering requirements, basement location and extent should be verified before attempting any planting. A commonly used alternative approach is planting trees in raised planters. See page 40 for guidelines in their placement and design.

Overhead Utilities

Trees that grow to a height greater than 25' will come in contact with any overhead utility wires. If a tree of this size is required, plant species which will not be disfigured by the pruning required to keep branches clear of utility wires. The City is committed to underground power and signal (television, telephone) lines. Where there is conflict between overhead utilities and proposed tree planting, check with the Department of Public Works, Bureau of Engineering - Electrical 554-8310, to see if and when undergrounding is scheduled for the district.

Parallel Parking

Trees should be planted as far as possible from the curb. The opposing concern is maintaining a preferred minimum clearance of 5' between the tree trunk and face of building (in commercially zoned areas, a 7' minimum clearance is preferred).



If parallel parking is metered, trees should be aligned as closely as possible with stall marking in the street. This will prevent tree damage caused by opening car doors.

Diagonal and Perpendicular Parking

Trees should be planted a minimum of 2'-0" from the face of curb at perpendicular parking and 3'- 0" minimum at diagonal parking to allow for vehicle overhang.

Tree Planting Standards

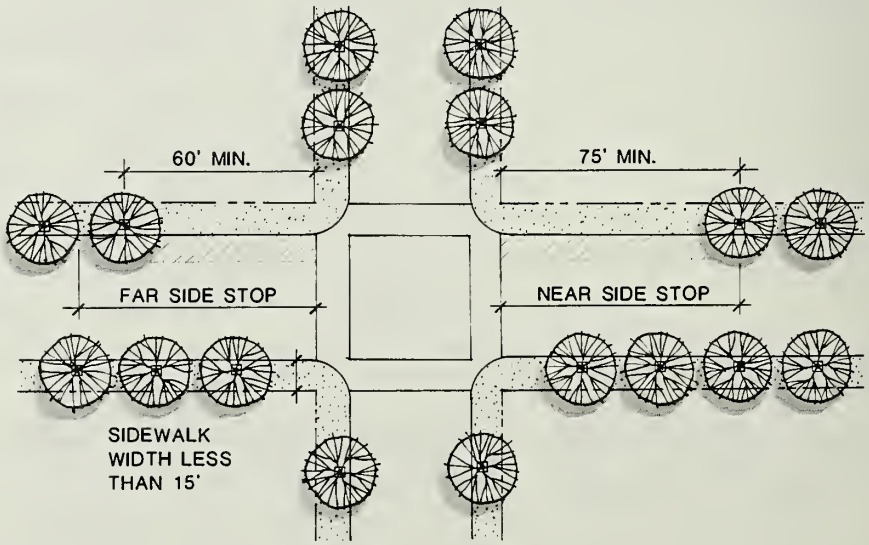
The following standards were adopted by the Interdepartmental Committee on Traffic and Transportation (ISCOTT) in June 1983 and are included here as guidelines for street tree placement.

Bus Stops

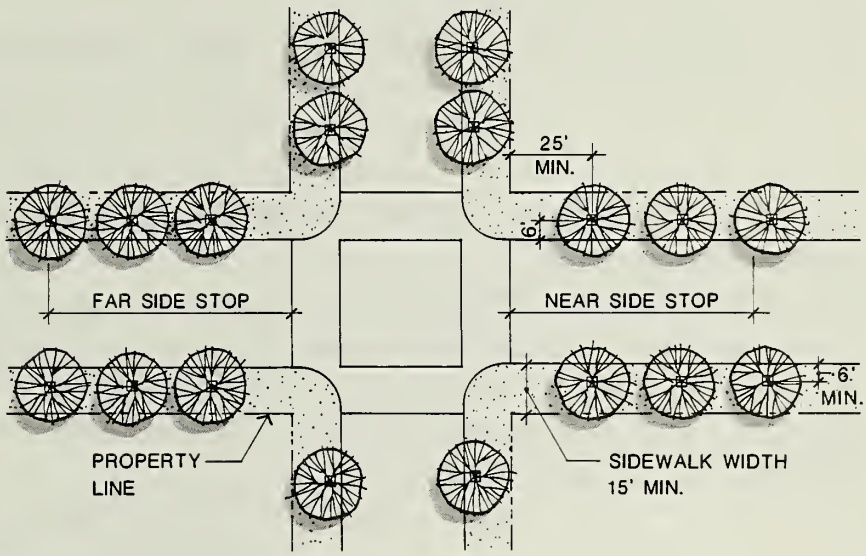
- Where the sidewalk is less than 15' wide, tree planting locations shall follow these guidelines:

1. Near Side Bus Stop - trees shall be planted no closer than 75' from the corner property line.

2. Far Side Bus Stop - trees shall be planted no closer than 60' from the corner property line.



- Trees may be planted within the near and far side bus stops where the sidewalk is 15' or greater. In this case, trees shall be planted 6' minimum from the face of the curb.



Intersections

- On the approach to any intersection, trees shall be planted no closer than 25' from the corner property line.

- Trees located in the sidewalk area shall be so located that visibility of traffic signals or STOP signs will be assured at all times.

Fire Hydrant and Fire Escapes

- Trees shall be planted no closer than 5' from either side of a fire hydrant.

- The width of the fire escape balcony, projected down to the sidewalk and to the curb, shall remain clear of any trees.

Other Common Sidewalk Features

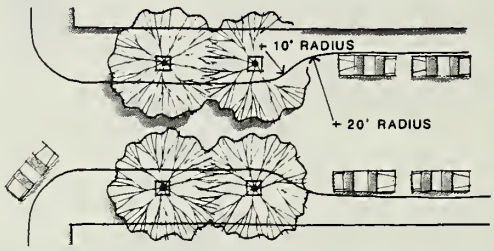
Gas and Water-meter and mains .....5'
Manhole and other utility vaults .....5'
Telephone and other utility poles .....5'
Parking meters .....5'

Median Islands

- Within the stopping sight distance, shrubs 3' high maximum are recommended as long as the planting design assures the clear visibility of traffic control devices at all times. Trees shall be planted a minimum of 2' from the face of the curb.

Tree Pockets

When continuous tree plantings are either impractical or undesirable, tree pockets are an excellent way of inserting trees along City streets. If curbs are re-aligned in the process, they must conform to the Department of Public Works street sweeper requirements.



Gateways

The City's primary vehicular entrances and exits or "gateways" are excellent opportunities for distinctive and, in certain locations, dramatic tree plantings. Gateways typically occur as linear corridors, such as Lombard Street or 19th Avenue, or as nodal spaces such as freeway ramps and interchanges.

Linear corridors lend themselves to rhythmic plantings of distinctive species such as palms, Eucalyptus or Gingko. Extended plantings of this type create a streetscape inviting entry and movement.

Nodal spaces should be planted with tree massings with a bold presence as well as sufficient height to soften adjacent freeway structures. Trees which are attractive in groves, such as certain species of Eucalyptus or pines, are examples of appropriate species in these locations. The effect tends to suggest an anchored or grounded feeling.

DESIGN GUIDELINES FOR DISTRICT STREETS

PLANNING CONSIDERATIONS

Aesthetic Character

District streets should show a more varied street tree planting than major and secondary thoroughfares. Street tree plantings in which species change frequently are generally preferred by residents and those who work in these neighborhoods. Monoculture plantings spanning several blocks are often seen as less desirable.

This contrast between the mosaic of species on district streets and the more consistent, unified tree plantings of the major and secondary thoroughfares will serve to reinforce the respective place of each street type in the City's urban form.

Land Use Factors

The scale and type of land use on a district street has a significant influence on the streetscape character, and must be considered in the tree selection process.

Residential and Commercial Areas. The tree selection process in residential and commercial areas must carefully consider how a particular tree will compose with the building elevations. Trees should not be placed directly opposite entries; they should frame rather than obscure views. Trees can be selected to reinforce an architectural composition (for example, a row of Victorians or a building of architectural merit) or unify a residential street frontage of dissimilar architectural styles. Existing residential street trees or existing trees in landscape setbacks should also be considered as potential elements to build on for an overall streetscape effect. Major nearby open space tree plantings can also be incorporated or "borrowed" into a streetscape composition.

Street trees planted along neighborhood shopping or commercial areas should serve to support the commercial activity, as well as improve the pedestrian experience. High pruning, at approximately 12 feet, allows visibility of store signs but diminishes the trees' enhancement of the pedestrians' experience.

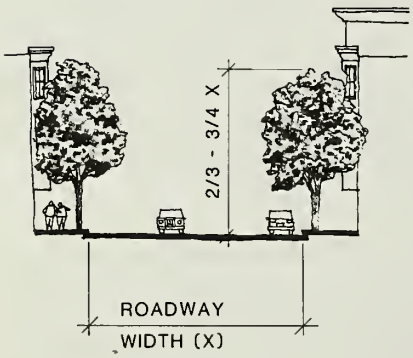
Trees on shopping streets help separate the sidewalk from parked cars and vehicular traffic.

Since many of San Francisco's commercial areas are walking streets rather than suburban strips or malls, street trees should generally be selected and pruned for the pedestrians' benefit, with careful placement the means of ensuring that commercial signing will remain visible.

As an alternative, a highly controlled tree form is desired, select a tree species which accepts pollarding or heavy pruning without severe disfigurement (e.g., Platanus acerifolia or Ficus nitida).

Industrial Areas. Industrial buildings differ from most residential and commercial properties in their larger bulk and scale. Medium to large trees with good mass and substance more effectively compose with industrial building types.

Roadway Profiles



The horizontal dimensions of a street right-of-way are an important factor in selecting an appropriate tree. As a general rule for commercial and residential district streets, the height of a street tree at maturity should equal approximately 2/3 to 3/4 of the horizontal distance of street from curb to curb. Thus, depending on street width, most street trees on district streets will be 25' - 40' tall. This range in tree heights will establish a visually pleasing relationship between the roadway and its vertical edge, while reserving large trees (greater than 50' in height) for major thoroughfares and plantings along large buildings.

A more dramatic effect can be achieved by planting street trees which exceed the generally recommended height. A careful consideration of a larger tree's effect on views, sun/shade patterns, and maintenance costs (pruning, sidewalk damage), however, must precede selecting a large street tree.

Tree Size

As indicated under Roadway Profiles, small to medium sized trees are suggested for most district streets. This tree size: minimizes pruning and maintenance requirements; reinforces the hierarchy of City streets by primarily reserving large trees for major and secondary thoroughfares; and minimizes view obstruction, a common concern of City residents.

Medium to large trees are recommended in industrial areas and along any building type - residential, office, institutional - where trees of this size are necessary to complement the mass and scale of the structure.

Species Variety

The highly directional visual quality of a linear street tree planting suggests that for greatest aesthetic effect, species selection be limited to two species maximum per block. When more than two species occur, street tree plantings usually will lack the visual unity and rhythmic cadence achieved with the more restrained hand.

Single species planting of Plane trees match the size and scale of the Hall of Justice.

One Species Plantings. District blocks planted with one species create a clear vivid aesthetic experience where mood or character will depend on the selected species. Spacing between trees is critical. Small trees should be spaced so that their canopies touch or nearly touch. Medium to large trees need not be planted this closely to be effective, but can be if so desired.

Two Species Plantings. Two species plantings should be carefully selected for compositional unity. Combinations include vertical layering of small trees with medium or large trees, trees of similar ecological type (for example, Southern Magnolia and Liquidambar), or trees of the same genus but different species (Pyrus kawakamii and P. calleryana). Two species plantings allow for more planning flexibility and can encourage greater neighborhood participation and enthusiasm.

Three or more species plantings. On some occasions, a street will have existing trees of several different species. In these instances, limiting proposed trees to one or two species is not as critical, although new trees should be selected with an eye toward unifying and complementing the existing plantings.

Aesthetic Considerations

Once an analysis of a site's environmental factors has narrowed the list of species adapted to a particular street, a review of each tree's aesthetic characteristics will usually lead to selection of one to several species.

Texture. Leaf and bark texture contribute to a tree's rugged, refined, and/or sculptural form. Exceptionally smooth bark is more prone to receiving and showing vandalism.

Course peeling bark of a Plane tree. Bark texture is an important tree feature, especially to the pedestrian.

Shape. A tree's shape may prompt a sense of order and control (round, upright, pyramidal), express sculptural boldness (spreading), or dramatize the monumental (columnar). Select trees which will harmonize with the architectural form and style of adjacent buildings.

Environmental Response. A tree's formal characteristics are important for their interaction with environmental factors and conditions, as well as aesthetic interest. The two most important environmental factors to consider when selecting street trees in San Francisco are wind and sunlight.

Winds are a common climatic condition in many areas of the City. Wind-tolerant trees can be used as a wind buffer or break. Moreover, certain trees such as Eucalyptus, Palms, Mayten, Melaleuca, or Australian Willow (Geijera parviflora), behave very gracefully in winds. If possible, select trees which to some degree will respond to winds with aesthetic effect.

Year-round coastal fog and overcast skies block sunlight in varying degrees throughout San Francisco. As a consequence, the dense shade tree, characteristic of most urban forests, may be an inappropriate choice in some parts of the City. An open-

Willow tree at Alamo Square. Trees which respond gracefully to winds are an asset in the City's coastal climate.

canopied tree (e.g., Tristania conferta, Ginkgo biloba, or Eucalyptus nichollii), or an upright tree (e.g., Pyrus calleryana or Liquidambar styraciflua) will not cast large, dark shadows. Trees of these forms are appropriate where climate or building heights limit the amount of sunlight.

Leaf and Flower Color. The color of a tree's leaf and flower are also important factors contributing to its overall aesthetic effect. The glossy, translucent apple green leaves of a budding Pyrus kawakami exemplify a leaf type which brilliantly captures and reflects light. Translucent, warm green leaves are more receptive of light than opaque, cool green leaves, and may be preferable where sun is infrequent.

Flowers and fruits provide additional fragrance and color, as well as attracting animal life. Fruit drop, however, should be evaluated when selecting trees near sidewalks and driveways.

Poetics. In addition to having rich and varied aesthetic characteristics, trees possess a great number of poetic and/or metaphorical associations. "The importance and veneration attributed to a tree does not arise from its existence as a natural object but from the essence that underlies it and that moulds the world", wrote Johann Krafter in his essay "The Tree and Architecture".

The psychologist C. G. Jung determined after years of research that his patients associated trees with "...the concepts of growth, life, the unfolding of form in both the physical and spiritual sense, development, growth from the low to the high and vice versa, the material aspect (protection, shade, shelter, fruit and nourishment) source of life, endurance, duration, radication

(and also, of the impossibility of removal), old age, personality and finally, death and rebirth (op. cit.)."

The archetypal significance of trees elaborated in Jung's research suggests why trees are so profoundly needed in highly urbanized areas, apart from their more utilitarian uses. This attachment to trees has been seen repeatedly in San Francisco where, despite climatic and environmental constraints, an urban forest has been nurtured into being over the past century.

The poetic/metaphorical qualities associated with trees will vary in intensity from person to person. Moreover, each tree species expresses these metaphorical qualities in different degrees. The symbolisms associated with a Monterey Cypress for example, do not entirely overlap with those of a Purple-Leaf Acacia. Each tree expresses a unique character or personality which, when carefully considered, will give greater meaning to the tree selection process, and help ensure that the trees chosen will be valued and cared for.

Maintenance

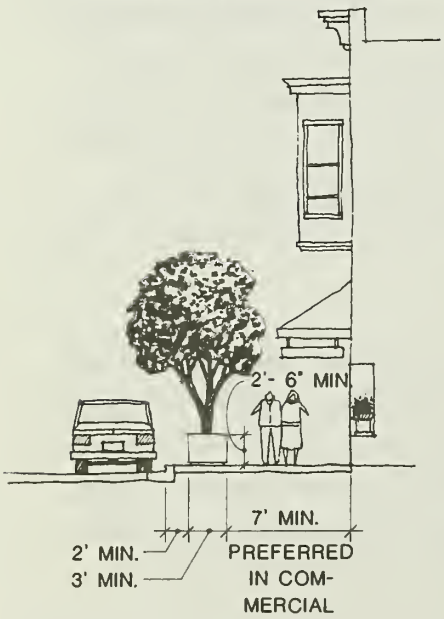
The level of maintenance required by different species varies considerably. Critical factors include shallow roots (pavement damage), brittle wood, frequency of pruning, and disease and insect infestation. The San Francisco Tree Matrix (see Appendix) identifies which trees are susceptible to each of these problems.

Trees in Raised Planters

In some parts of the City, most notably Chinatown and the Financial District, sub-sidewalk basements preclude planting trees at curb grade. In these areas, raised planters provide an alternative means of introducing trees and/or shrubs. With proper maintenance and regular watering, raised planters are particularly effective in the Financial District, where the street level is often lacking in textured or finely detailed elements.

Many kinds of raised planters may be purchased or constructed. Typical materials are wood, precast concrete, or simulated lightweight concrete where weight and/or access are design factors.

Recommended planter location and sidewalk clearances are illustrated to the left.



DESIGN GUIDELINES FOR MAJOR AND SECONDARY THOROUGHFARES

Introduction

The major and secondary thoroughfares are the routes most frequently taken by both resident and visitor, and thus in a fundamental way structure our shared image of San Francisco. Trees can significantly improve the visual quality of the City streetscape, providing a sense of rhythm, visual unity and mood. Anyone, for example, who has seen Dolores Street in the Mission District can vividly recall the center island planting of Date Palms which establish a joyous cadence as they rise and fall with the street grade.

Palms on Dolores St., perhaps the City's most memorable street tree planting.

Trees planted along commercial development can help promote an attractive environment for shoppers and workers, particularly in San Francisco, where many commercial districts are most frequented by pedestrians.

Most of the major and secondary thoroughfares in the City are already planted with street trees. The plantings, though, are as likely to reflect changing fashions in the nursery industry and the whims of individual property owners as they are to reflect a considered evaluation of the aesthetic and horticultural concerns of the streetscape. The gradual transition to the recommendations made in the Plan should be a civic project which is supported and given high priority by all segments of the San Francisco community.

Objectives

The objectives of the design recommendations for major and secondary thoroughfares are:

- To develop a range of streetscapes which re-inforce the significance of San Francisco's major streets with respect to regional transportation systems, intra-city travel, and community or neighborhood definition.

- To highlight neighborhood shopping streets as important focal areas within the context of the City's rich and varied districts.

- To develop streetscapes as memorable evocations of the spirit and character of San Francisco.

Tree Selection Criteria

The following criteria were considered during the tree selection process for the City's major and secondary thoroughfares:

- Trees must be able to be pruned so that branching is held to a minimum of 8' above sidewalk paving, and also to avoid overhead wires without causing severe disfigurement.

- Sunlight is precious in San Francisco. Open-canopied evergreen trees and deciduous trees are given first consideration.

- Winds in the City are often severe. Wind-tolerant trees which visually "express" this condition (e.g., Melaleuca, Eucalyptus, Tristania, Palms) are in this regard preferable to stiff, visually static species such as Ficus microcarpa.

Tree Uses

Dominant Trees. Dominant trees establish the visual character for each thoroughfare. Recommendations include species selection and spacing.

Accent Trees. Generally smaller than dominant trees, accent trees are recommended where an additional street tree is desired for its particular aesthetic characteristics, such as leaf or bark texture and/or flower color. Accent trees are generally used in commercial areas, median strips to delineate vehicular entries, and for the enhancement of individual building facades.

THOROUGHFARES

LEGEND

- FREEWAY
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- DOWNTOWN INSET (See Figure 5)

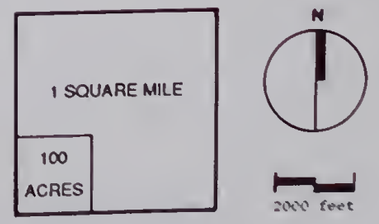


Figure 4

Recommendations for Major and Secondary Thoroughfares

Following are indices of the major and secondary thoroughfares in alphabetical order. Each major thoroughfare is later described in terms of location, land use, design considerations and existing street trees. A briefer format is used to describe secondary thoroughfares. The location of the major and secondary thoroughfares is shown in Figure 4. Finally, the primary downtown streets are individually described. A map of these streets is shown in Figure 5.

MAJOR THOROUGHFARES INDEX

Alemany Boulevard 48
Army Street 49
Battery Street 50
Bay Street 51
Broadway 52
Brotherhood Way 53
Bryant Street 54
Bush Street 55
California Street 56
Columbus Avenue 57
Dewey Boulevard 58
Divisadero Street 59
The Embarcadero 60
Fell Street 61
Franklin Street 62
Fulton Street 63
Geary Boulevard 64
Geneva Avenue 66
Golden Gate Avenue 67
Gough Street 68
Harney Way 69
Harrison Street 70
Junipero Serra Boulevard 71
Laguna Honda Boulevard 72
Lake Merced Boulevard 73
Lincoln Way 74
Lombard Street 75
Market Street 76
Masonic Avenue 78
Nineteenth Avenue 79
Northpoint Street 80
Oak Street 81
Ocean Avenue 82
Park Presidio Boulevard 83
Pine Street 84
Portola Drive 85
Potrero Avenue 86
Sansome Boulevard 87
Skyline Boulevard 88
Sloat Boulevard 90
South Van Ness Avenue 91
Third Street 92
Townsend Street 93
Turk Street 94
Van Ness Avenue 95

SECONDARY THOROUGHFARES INDEX

Balboa Street 97
Bosworth Street 98
Castro Street 99
Clarendon Avenue 100
Clipper Street 101
Diamond Heights Blvd. 102
Dolores Street 103
Evans Street 104
Great Highway 105
Guerrero Street 106
Hunters Point Boulevard 107
Industrial Street 108
Innes Avenue 109
Jamestown Avenue 110
John Muir Drive 111
Mission Street 112
Monterey Boulevard 113
Noriega Street 114
Oakdale Street 115
O'Shaughnessy Boulevard 116
San Jose Avenue 117
Santa Clara Avenue 118
Seventh Avenue 119
Seventeenth Street 120
Silver Avenue 121
Stanyan Street 122
Sunset Boulevard 123
Taraval Street 124
Valencia Street 125
Vicente Street 126
Woodside Avenue 127

Broadway 52
Bush Street 55
California Street 56
Clay Street 141
Columbus Avenue 57
Eight Street 134
Fell Street 61
Fifth Street 133
First Street 131
Folsom Street 135
Fourth Street 132
Franklin Street 62
Fremont Street 131
Fulton Street 63
Geary Boulevard 142
Golden Gate Avenue 67
Howard Street 135
Hyde Street 138
Jones Street 138
Kearny Street 136
Larkin Street 138
Leavenworth Street 138
Mason Street 139
McAllister Street 143
Montgomery Street 136
Ninth Street 134
Oak Street 82
O'Farrell Street 142
Pine Street 85
Post Street 142
Powell Street 137
Seventh Street 134
Sixth Street 133
Tenth Street 134
The Embarcadero 60
Third Street 132
Townsend Street 93
Turk Street 94
Van Ness Avenue 95
Washington Street 140

The Design Guidelines for Major and Secondary Thoroughfares discusses each of the above streets and makes recommendations based on detailed field surveys which analyzed existing trees and neighborhood character. The development of consistent tree plantings was a major factor guiding the selection of street tree species for the thoroughfares. Another concern is expressed in the City's Master Plan, which states that extensive buffers should be used to separate busy thoroughfares from sidewalks, plazas, and squares. Street trees are the key element in separating vehicular traffic from these zones.

While local and minor streets in San Francisco are not specifically addressed in the Plan, the concepts, policies and guidelines apply to all street tree plantings. It is intended that the information provided be used to select species that are aesthetically and horticulturally appropriate for the entire city.

ALEMANY BOULEVARD

Location From the junction of I-280 and U.S. 101 to the junction of Junipero Serra Boulevard and I-280.

Description The street varies from four to six lanes with a median throughout its length. It has an integral relationship with the freeway network at both ends and to a large extent closely parallels I-280. Land uses are primarily residential with neighborhood commercial. In most areas, the sidewalks are narrow and there are overhead MUNI wires.

Considerations Consideration should be given to the visual screening of the freeway network and rear yards adjacent to Alemany Boulevard in the area of Naglee Avenue.

Existing Trees Tristania conferta, Metrosideros excelsus, Ulmus pumila, Pittosporum crassifolium, Eucalyptus ficifolia, Platanus acerifolia and Cupaniopsis anacardioides. Metrosideros and Ulmus occur most frequently.

Recommendations Alemany Boulevard appears wider than it actually is due to the low height of the adjacent residential buildings. A medium to large tree such as Tristania conferta should be planted to improve the neighborhood character and help screen the freeways.

The freeway network and rear yards adjacent to Alemany Blvd. should be screened with trees.

Freeway support ramps and steep embankments dominate the landscape at both ends of Alemany Boulevard. Low-maintenance plantings such as Myoporum laetum, Acacia melanoxylon and Acacia longifolia should be incorporated to soften the freeway architecture.

Location From Third Street to Church Street.

Description Army Street consists of four to six lanes with a median from U.S. 101 to Guerrero only. It is a main east-west thoroughfare extending from the Bayshore to the central part of the City. East of U.S. 101, Army Street traverses a primarily industrial area. Railroad tracks crisscross the street and the sidewalks are used for car and truck parking. West of U.S. 101, the street passes through a multi-family residential area of 2-3 story buildings. Farther west, Army Street narrows to two lanes with parking and fifteen foot sidewalks.

Considerations Plantings should be tolerant of frequent westerly winds.

Existing Trees Acacia melanoxylan, Platanus acerifolia, Tristania conferta, Metrosideros excelsus, Ligustrum lucidum.

Recommendations Third Street to U.S. 101:

- Eucalyptus nicholii at 40 feet on center.

U.S. 101 to Guerrero Street:

- Tristania conferta at 40 feet on center.
- Washingtonia robusta in median 40 feet on center.

BATTERY STREET

Location From The Embarcadero to Market Street.

Description Battery Street is a two-lane southbound street with nine-foot sidewalks flanked by mid to high-rise office buildings.

Considerations Overhead wires.

Existing Trees North of Broadway: Platanus acerifolia, Ficus microcarpa.
South of Broadway: Ginkgo biloba, Olea europaea.

Recommendations

- Platanus acerifolia at 40 feet on center (dominant).
- Ginkgo biloba at 30 feet on center, south of Broadway (accent).

BAY STREET

Location From The Embarcadero to its connection with Marina Boulevard.

Description Bay Street parallels the City's northern waterfront and borders Fisherman's Wharf. This four-lane thoroughfare is heavily used by Golden Gate Bridge commuters and out-of-town visitors. Most of the adjacent buildings are 3-5 story commercial intermixed with multi-family residences set back six to eight feet. Architectural styles vary from Victorian to contemporary.

Considerations The narrow sidewalks and Bay-influenced climatic conditions are factors influencing tree selection.

Existing Trees Ficus microcarpa, Platanus acerifolia, Eucalyptus spp. and Pittosporum undulatum.

Recommendations The Embarcadero to Columbus Avenue:

- Platanus acerifolia at 40 feet on center.

Columbus Avenue to Van Ness Avenue:

- Tristania conferta at 40 feet on center.

The full-grown avenue planting of Plane trees on Bay St. display a beautiful, continuous canopy.

Location From Battery Street to Gough Street.

Description Broadway, a four-lane east-west artery, traverses the Northeast District. A portion the street passes through the Broadway Tunnel, which runs under Russian Hill between Mason and Larkin Streets. Between Battery and Mason Streets, the land uses are primarily retail, mixed with residential and office. This area is characterized by colorful signing and continuous vehicular and pedestrian activity. Buildings (3-5 story) are set back 12 feet from the curb. Between the west end of the tunnel and Gough Street the primary land use is multi-family residential.

Considerations The array of signing and high volume of pedestrian traffic east of the Broadway Tunnel should be considered when selecting street trees.

Existing Trees Acacia melanoxylon, Ficus microcarpa, Eriobotrya japonica, Myoporum laetum, Platanus acerifolia, Eucalyptus ficifolia, Metrosideros excelsus, Magnolia grandiflora.

Recommendations Battery to Mason Street:

- Callistemon viminalis at 20 feet on center (dominant)
- Ginkgo bilaba at intersection of Columbus Avenue (accent).

Larkin Street to Gough Street:

- Magnolia grandiflora at 40 feet on center (dominant).
- Eucalyptus ficifolia at intersection of Van Ness Avenue (accent).

BROTHERHOOD WAY

Location From Lake Merced to Alemany Boulevard.

Description Brotherhood Way is a four-lane thoroughfare with a ten-foot planted median set in a wide extensively landscaped right-of-way. This parkway runs east from the park setting of Lake Merced through a valley in the southernmost part of the Ingleside District. Vehicles travel at relatively high speeds. Twelve foot pedestrian pathways flank each side.

Considerations The street's east-west orientation and proximity to the coast increase the frequency and intensity of westerly winds and fog.

Existing Trees Cupressus leylandii, Pinus radiata, Pinus pinea and Eucalyptus ficifolia.

Recommendations Accent the existing conifers and Eucalyptus with an understory planting of native California trees and shrubs.

- Aesculus californica, Heteromeles arbutifolia, Garrya elliptica.

The Italian Stone Pines on Brotherhood Way reflect the majestic open spaces in the Lake Merced District.

BRYANT STREET

Location	From Division Street to Second Street.
Description	Bryant Street is a five-lane, east-bound thoroughfare in the South of Market District. It is used as a connector to U.S. 101 for East Bay-bound travelers. Bryant Street defines a boundary between commercial use to the north and industrial use to the south.
Existing Trees	Species found in limited numbers are Eucalyptus sideroxylon, Eucalyptus ficifolia, Ligustrum lucidum, Ficus microcarpa, Pittosporum undulatum and Ulmus pumila.
Considerations	Narrow sidewalks, seven to eight feet wide.
Recommendations	Tristania conferta at 40 feet on center.

BUSH STREET

Location From Masonic Avenue to Market Street.

Description Bush Street is a three-lane east-bound thoroughfare connecting the Downtown with districts to the west. Land uses along Bush Street are primarily residential with neighborhood commercial nodes between Masonic Avenue and Franklin Street. From Van Ness Avenue to Kearny Street, land uses on Bush Street are street-level commercial below residential or high-rise offices. The gentle slopes give the residential areas between Masonic and Franklin Street sweeping views of downtown San Francisco. Building heights increase from three to five stories to over twenty stories in the Financial District. Sidewalks are nine and twelve feet.

Considerations Muni overhead wires are present between Masonic Avenue and Franklin Street. Persistent shade and moderately high winds are characteristic of the microclimate along Bush Street in the Financial District.

Existing Trees Dominant species are Pittosporum undulatum, Magnolia grandiflora, Ligustrum lucidum, and Metrosideros excelsus.

Recommendations Masonic Avenue to Franklin Street:

- In minimum groups of three, alternate Metrosideros excelsus and Pittosporum undulatum.

Franklin Street to Mason Street:

- Pittosporum undulatum at 40 feet on center.

Mason Street to Market Street:

- Gingko biloba 'Fairmont' at 40 feet on center.

CALIFORNIA STREET

Location From Drumm Street to 32nd Avenue.

Description California Street is a four-lane east-west thoroughfare traversing the Financial District, Nob Hill, Pacific Heights, and the Richmond District. This major thoroughfare becomes secondary west of Park Presidio Boulevard. It also serves as a cable car route from the Financial District west to Van Ness. Building height varies from multi-story highrises at the eastern end to two story homes at the western end.

Considerations Prevailing westerly winds are a concern for planting. In the Financial District, tall office buildings cast persistent shadows.

Existing Trees Ficus microcarpa, Platanus acerifolia, Myoporum laetum and Eucalyptus ficifolia are planted on California Street. Ficus microcarpa is the dominant tree planted in containers in the downtown area. Platanus acerifolia is the dominant tree from Grant Street to 32nd Avenue.

Recommendations Market to Van Ness:
California Street is well landscaped with raised planters east of Kearny. Ficus retusa is recommended for any additional planters. Platanus acerifolia at 40' on center is recommended for at-grade plantings, particularly on the south side of the street atop Nob Hill.

Van Ness to 32nd Avenue:
Interplant the existing Platanus acerifolia with intermittent accent plantings of Eucalyptus ficifolia.

The pollarded Plane trees on California St. soften the streetscape without interfering with overhead bus wires.

COLUMBUS AVENUE

Location From Northpoint Street to Montgomery Street.

Description Columbus is a four-lane roadway that bisects the rectangular grid of the Northeast District at a 45 degree angle. The street has nine-foot sidewalks and is divided by a narrow median between Northpoint and Broadway. Columbus Street goes through three densely populated and heavily visited areas: the Downtown, Chinatown and North Beach. Distinctive landmarks associated with Columbus Avenue include the Transamerica Pyramid and the intersection at Broadway and Washington Square Park. Columbus also serves as an entry into the Fisherman's Wharf area.

Considerations Street tree plantings are affected by a Bay-influenced microclimate, heavy pedestrian traffic and overhead Muni wires. Attractive light standards should not be obscured by future tree plantings.

Existing Trees The species most frequently planted on Columbus are Ficus microcarpa and Eucalyptus ficifolia along the sidewalk, with Liquidambar styraciflua in the median.

Recommendations Commercial areas with signing:

- Tristania conferta.

Median:

- Liquidambar styraciflua.

DEWEY BOULEVARD

Location	From Laguna Honda Boulevard along Claremont Boulevard to Portola Avenue.
Characteristics	Dewey Boulevard is a two-lane street with a six to eight foot wide planted median strip. The adjacent land use consists of single-family residences.
Existing Trees	Existing trees are Metrosideros excelsus and Pinus spp.
Recommendations	Metrosideros excelsus at 40 feet on center.

DIVISADERO STREET

Location From Lombard Street along Castro Street to Market Street.

Description From Lombard Street to Sacramento Street, Divisadero has two lanes with parking and 12' sidewalks. Topography is steep and buildings are mainly large single-family detached residences with 10'-20' landscaped setbacks. It widens to four lanes with a 4' planted median from Sacramento to Waller Streets. Buildings in this area are mixed commercial and residential. Sidewalks are narrow (6'-9') and overhead utility wires are present.

Considerations The length of Divisadero implies the possibility of a variety of plantings due to the microclimates encountered. Narrow sidewalks and overhead utility wires in the Sacramento to Waller area call for care in choosing trees that will either be self-limiting in height or can be severely pruned without disfigurement.

Existing Trees Acacia melanoxlon, Maytenus boaria, Pittosporum undulatum, Metrosideros excelsus and Schinus molle.

Recommended Trees Lombard Street to Sacramento Street:

- Pittosporum undulatum at 40 feet on center.
- Platanus acerifolia at 40 feet on center.

Sacramento Street to Waller Street:

- Gingko biloba at commercial nodes at 30 feet on center.
- Pittosporum undulatum at 40 feet on center as infill.

THE EMBARCADERO

Location From Townsend Street (Pier 38) to Northpoint Street.

Description Embarcadero, the Spanish word for point of embarcation, is an appropriate name for this street wrapping around the City's Bay front. Shipping piers are located on the waterfront side of the street while land uses on the landside vary from industrial to office/commercial and recently constructed multi-family residential.

Considerations An elevated freeway dramatically affects the Embarcadero's visual quality between Howard Street and Broadway. The shade cast by the freeway structure, Bay-influenced climate and fill soils limit the number of suitable trees for this portion of the Embarcadero.

Existing Trees Platanus acerifolia and Pittosporum undulatum occur on The Embarcadero in the area around the Ferry Building and Fisherman's Wharf. Planters with Ficus nitida are placed in front of some buildings.

Recommendations Species recommendations for grove plantings on Downtown side of roadway include:

- Grove plantings of conifers such as Pinus canariensis, P. pinea.
- Lyonothamnus floribundus.

Sidewalk plantings (Downtown side only):

- Continue Platanus acerifolia - single rows at 40 feet on center on south side only.
- Tristania conferta at south end towards Townsend at 30 feet on center.

FELL STREET

Location From Polk Street to Stanyan Street.

Description Fell Street is a three-lane thoroughfare transporting traffic in a westerly direction from the Civic Center neighbor- hood west to Golden Gate Park. Mixed land uses consist of light industrial, commercial and multi-family residential. The Panhandle borders Fell Street between Baker and Stanyan Streets.

Considerations The east-west orientation of Fell Street subjects it to westerly winds. Overhead wires are an additional consideration.

Existing Trees Acacia melanoxylan dominates both sides of Fell Street. Also present in significant numbers are Tristania conferta, Ficus microcarpa and Acacia longifolia.

Recommendations

- Tristania conferta (dominant).
- Melaleuca linarifolia (accent in residential areas).

The tall, mature Brisbane Boxes on Fell St. match the size and scale of the Eucalyptus in the Panhandle across the street.

FRANKLIN STREET

Location From Oak Street to Lombard Street.

Description Franklin Street is a north-bound, three-lane thoroughfare traversing the hills of the Western Addition and Marina Districts.

Adjacent land uses are multi-family residential with neighborhood commercial nodes at the corners. Overhead wires have been placed underground. Sidewalks are nine feet wide.

Considerations The microclimate is generally favorable for street tree planting. North of Jackson Street, Franklin Street crests and is then subject to northerly winds.

Existing Trees The following trees occur with similar frequency: Platanus acerifolia, Pittosporum undulatum, Ficus microcarpa, Ligustrum lucidum and Tristania conferta.

Recommendations

- Pittosporum undulatum
- Tristania conferta

Location From Hyde Street to Larkin Street (see Downtown Thoroughfares Map) and Franklin Street to the Great Highway.

Description Fulton Street possesses two distinct characters. The block between Hyde and Larkin Streets is located in the heart of the Civic Center area. It has two lanes with 90 degree parking on both sides and basically functions as a parking lot between U.N. and Civic Center Plazas. Fulton Street from Franklin Street to the Great Highway varies from three to four lanes with parking on both sides and nine to twelve-foot sidewalks. It traverses the Western Addition and forms the southern boundary of the Richmond District, separating the multi-family residential buildings from Golden Gate Park.

Considerations West of Divisadero Street, Fulton Street has overhead Muni wires. Prevailing westerly winds sweep down Fulton Street from the ocean. The views to Golden Gate Park are an asset for Fulton Street residents; trees should not block views to the park.

Existing Trees Hyde Street to Larkin Street: Pollarded Platanus acerifolia planted in double rows at 30 feet on center.

Franklin Street to the Great Highway: Pittosporun undulatum, Metrosideros excelsus, Eucalyptus ficifolia and Liriodenron tulipifera.

Recommendations

- No trees are recommended from Arguello Boulevard to the Great Highway.
- From Stanyan Street to Franklin Street, narrow sidewalks and three-story facades require an upright tree. Pittosporum undulatum is recommended at 30-40 feet on center.

GEARY STREET

Location From Market Street to Point Lobos Avenue.

Description Geary Street, also known as Geary Expressway and Geary Boulevard, is a major east-west thoroughfare. Each appelation aptly describes its varying character. From Kearny to Gough, Geary Street consists of three west-bound lanes passing through the Downtown District. Significant points of interest include Union Square, St. Francis Hotel and the theatre district. From Mason to Gough, Geary Street land uses are primarily commercial at street level with residential hotels or apartments above. West of Mason Street, building heights decrease from 8-12 story to 2-5 story. Sidewalks are nine feet wide. Where Geary Street becomes Geary Expressway, it changes to four lanes in each direction with a planted median strip. At Divisadero, the street narrows to three lanes in each direction, becoming Geary Boulevard at Masonic Avenue, and continues to the ocean.

Considerations Westerly winds, particularly west Masonic; overhangs, signing and awnings at hotels, theaters and commercial areas.

Canary Island Pines provide a soft evergreen buffer in the center median on Geary Blvd.

Existing Trees

There are few street trees on Geary Street between Kearny and Gough Streets. Geary Expressway and Boulevard have been recently planted with a variety of trees. Dominant species include Metrosideros excelsus and Platanus acerifolia. Less frequent species include Ficus microcarpa, Cupressocyparis leylandii, and Olea europaea.

Recommendations

On the eastern part of Geary from Kearny to Gough, standard shrubs such as Photinia fraseri, Ficus microcarpa or Ligustrum japonicum are recommended in raised planters.

Gough Street to Divisadero:

- Platanus acerifolia as a sidewalk tree.
- Pinus canariensis in the median.

Masonic Avenue to 38th Street:

- Metrosideros excelsus.

38th Street to the Great Highway:

- Metrosideros excelsus or Rhamnus alaternus at 30 feet on center.

Park Presidio intersection:

- Pinus canariensis as a median accent.

Masonic Avenue intersection:

- Tristania conferta as median accent.

GENEVA AVENUE

Location From Ocean Avenue to the City and County line.

Description Geneva Avenue is a four-lane thoroughfare located near the City's southern border. Neighborhood commercial and multi- and single-family residential are the adjacent land uses. At Rio Verde Street, Geneva increases to six lanes with turn lanes to accommodate Cow Palace traffic and freeway access.

Considerations Street trees must be compatible with overhead transportation wires and power lines. Between Ocean and Mission Street, the sidewalks are only six feet wide.

Existing Trees With the exception of the mature landscaping at McLaren Park, there are few existing street trees. Myoporum laetum, Metrosideros excelsus, and Eucalyptus spp. and Pinus spp. are the most frequently planted species.

Recommendations Mission to Delano Street:

- Metrosideros excelsus or Schinus terebinthifolius at 30 feet on center.

Delano Street to Ocean Avenue:

- Pinus radiata or Eucalyptus nicholii at 40 feet on center are recommended for this Bay-exposed site.

Geneva Avenue, a heavily used thoroughfare in the Excelsior District, would benefit from additional trees.

GOLDEN GATE AVENUE

Location From Market Street to Broderick Street.

Description Golden Gate is a three-lane eastbound street with 12 foot sidewalks conveying traffic into the City from the U.S. 101 exit at Franklin Street. Golden Gate Avenue from Franklin to Hyde Streets is bordered by large government office buildings. From Hyde to Market, it is flanked primarily by small commercial establishments at street level with apartments and residential hotels above. Adjacent land uses between Broderick and Franklin are primarily 2-3 story residential.

Considerations Overhead wires have been placed underground.

Existing Trees Existing trees include Pittosporum undulatum, Eucalyptus ficifolia, and Platanus acerifolia. There are virtually no street trees from Market to Hyde Street.

Recommendations Polk Street to Market Street:

- Platanus acerifolia at 40 feet on center.

Franklin to Broderick Street:

- Pittosporum undulatum at 40 feet on center.

GOUGH STREET

Location From California Street to Market Street.

Description Gough Street's three south-bound lanes traverse the hills and valleys of the eastern border of the Marina and Western Addition Districts. The adjacent land use is primarily four to six story multi-family residential except at the intersection of Geary Street and Gough Street, where the land uses are institutional (churches, schools and parks). South of Geary is the access ramp to U.S. 101. Vehicular speed tends to increase to this point and then drop off as Gough Street passes through the commercial area just north of Market Street.

Existing Trees Ficus microcarpa and Platanus acerifolia are dominant. Other species include Pittosporum crassifolium, Callistemon citrinus and Olea eurepaea.

Recommendations California to Geary Expressway:

- Tristania conferta at 40 feet on center.

Geary Expressway to Golden Gate:

- Olea europaea at 30 feet on center.

Golden Gate to Market:

- Tristania conferta at 40 feet on center.

HARNEY WAY

Location From Jamestown Avenue to the City and County line.

Description Harney Way is a six-lane street providing the primary access to Candlestick Park from northbound U.S. 101. It also services a business park and State Recreation Area. There are no shoulders or sidewalks.

Considerations This shoreline roadway is exposed to winds and salt spray. Soils are likely composed of Bay-fill soil. There are panoramic views to the hills, San Bruno Mountain and San Francisco Bay.

Existing Trees Eucalyptus spp., Pinus radiata, Myoporum laetum and Melaleuca nesophila are planted at the nearby State Recreation Area. Acacia melanoxylon and Populus nigra 'Italica' are found in the adjacent business park.

Recommendations Available planting sites are primarily in-fill for the right-of-way.

Pinus pinea should be planted in unrestricted areas on both sides of the road at fifty foot intervals.

HARRISON STREET

Location	From Steuart Street to Tenth Street.
Description	Harrison Street is a five-lane westbound thoroughfare in the South of Market District. The adjacent land uses are predominantly commercial and industrial. Harrison Street provides freeway access to southbound U.S. 101 and I-280.
Considerations	Narrow, six-foot sidewalks.
Existing Trees	Species occurring mostly on the north side of the street include Magnolia grandiflora, Platanus acerifolia, Ligustrum lucidum, Pittosporum undulatum, and Schinus terebinthifolius.
Recommendations	Ginkgo biloba at 40 feet on center.

JUNIPERO SERRA BOULEVARD

Location From Portola Avenue to Alemany Boulevard.

Description Junipero Serra Boulevardis a six-lane throughfare of six lanes running north and south with a Muni Railway station-stop located in the median from Portola Avenue to Ocean Avenue. From Ocean Avenue to Nineteenth Avenue, the 13' median is planted. The street is distinguished by monuments at neighborhood entries and ornate street lights.

Considerations Vehicular speeds are high. Climate is marine influenced.

Existing Trees Dominant trees are Pinus radiata and Ulmus pumila. Eucalyptus ficifolia, Metrosideros excelsus and Acacia melanoxylon have also been planted.

Recommendations

- Eucalyptus ficifolia at 40 feet on center, west side only.
- Melaleuca quinquenervia at 30 feet on center, east side only.

Junipero Serra Boulevard's median is landscaped with pines and clipped Escallonia.

LAGUNA HONDA BOULEVARD

Location	From Seventh Avenue to Dewey Boulevard.
Description	Laguna Honda Boulevard is a short connector street linking Seventh Avenue and Dewey Boulevard. Naturalized open space borders both sides of the street. Sidewalks are narrow, six to nine feet.
Existing Trees	Pittosporum undulatum, Eucalytus spp., Acacia spp. and Pinus spp. (naturalized).
Recommended Trees	None needed.

LAKE MERCED BOULEVARD

Location From Sunset Boulevard to the City and County line.

Description Lake Merced Boulevard is a four-lane street curving around the eastern shoreline of Lake Merced. It is bordered on the east by residential development with expansive views of the Lake. A ten-foot wide multi-use path borders the street on the lakeside. A park-like atmosphere is created by the lake and the adjacent open spaces of Harding Park Golf Course, the Olympic Country Club and San Francisco State University. Brotherhood Way intersects Lake Merced Boulevard on the east side of the Lake.

Considerations Views to the Lake should be preserved. Plantings should not interfere with the multi-use path. The intersection with Brotherhood Way should be accented with colorful street tree plantings.

Existing Trees Cupressus macrocarpa, Pinus radiata and Acacia longifolia.

Recommendations Native plantings consisting of Cupressus macrocarpa, Pinus spp., with Ceanothus spp. and Heteromeles arbutifolia as understory accent.

LINCOLN WAY

Location From Seventh Street to the Great Highway.

Description Lincoln Way is a four to six-lane thoroughfare that runs along the southern border of Golden Gate Park. It is most heavily traveled from the Great Highway to Seventh Avenue where it connects with Kezar Drive through the southeast corner of Golden Gate Park. Adjacent land uses are primarily residential with neighborhood commercial nodes occurring between Nineteenth Avenue and Stanyan Street. Buildings are set back fifteen feet from the street with parking on the south side.

Considerations Residential views of Golden Gate Park and the maritime climate are primary considerations.

Existing Trees Acacia melanoxylon, Myoporum laetum, Platanus acerifolia, and Ficus microcarpa.

Recommendations

- Callistemon viminalis, 30 feet on center.
- Melaleuca linarifolia, 30 feet on center.

LOMBARD STREET

Location From Van Ness Avenue to Broderick Street continuing to Richardson Avenue.

Description Lombard Street is part of the U.S. 101 Business Route through San Francisco. A six-lane east-west thoroughfare, with a narrow median and 10-foot sidewalks, it serves as the northern gateway into San Francisco. Land uses consist primarily of neighborhood and general commercial. Richardson Avenue links Lombard Street and
U.S. 101.

Considerations Commercial signing, especially for motels.

Existing Trees The dominant street tree is Ficus microcarpa. Other species include Acacia melanoxylon, Callistemon citrinus and Ligustrum lucidum.

Recommendations As a gateway into the City, plantings should be unified and dramatic.

- Washingtonia robusta at 60 feet on center (dominant).
- Tristania conferta where plantings will not conflict with signing (accent).

Mexican Fan Palms with an accent of Brisbane Box trees are recommended for Lombard St.

MARKET STREET

Location From The Embarcadero to Portola Drive.

Description Market Street is one of the most prominent thoroughfares in the City. Laid out by Jasper O'Farrell in 1846, it bisects the City's downtown grid of streets at a 45 degree angle, separating the Downtown/Civic Center District from the South of Market District. Market Street is terminated at the Bay by the Ferry Building (located at the midpoint of the piers), and by Twin Peaks to the west.

Market Street can be divided into three distinct sections:

Downtown. The downtown portion (from Gough Street to the Ferry Building) is four lanes and accommodates vehicles, MUNI railway, buses and BART (underground). The area is characterized by tall office buildings and sidewalks 30' wide.

Duboce Triangle. Market Street continues the same alignment between Gough Street and Castro Street, but its character changes. At this point, the primarily commercial buildings are 2-3 stories high. Sidewalks are narrow to twelve feet.

The double rows of Plane trees on Market Street were planted in underground vaults.

Upper Market. The southwestern portion of Market Street is a curving four-lane thoroughfare that winds up the foothills of Twin Peaks. It passes through a primarily residential area with corner commercial nodes. The sidewalks vary in width from a minimum of six feet up to eighteen feet. A raised concrete divider separates opposing traffic. From many points along this stretch of Market Street, there are panoramic views of the City and East Bay.

Considerations

Winds can be high west of Valencia Street and at intersections in the Downtown.

Existing Trees

Downtown Market Street is planted with Platanus acerifolia in double rows. From Castro Street to Portola Avenue, Magnolia grandiflora, Pittosporum undulatum, Tristania conferta and Metrosideros excelsus can also be found.

Recommendations

Downtown

- Platanus acerifolia is recommended for replanting and interplanting sidewalks on the downtown section of Market Street from The Embarcadero to Castro Street, except between Duboce Street and Dolores Street. The use of a single species and symmetrical plantings creates a formal boulevard effect befitting one of the most prominent streets in the City.

Duboce Triangle

- Washingtonia robusta in existing tree wells (Duboce to Dolores).
- Platanus acerifolia (Dolores to Castro).

Upper Market

Danvers Street to Portola Avenue:

- Eucalyptus nicholii (west side only at back of sidewalk).
- Ficus pumila on center divider.

MASONIC AVENUE

Location From Pine Street to Frederick Street.

Description Masonic Avenue is a four-lane, north-south thoroughfare flanked by nine foot sidewalks. Between Fulton and Fell Streets, it widens to six lanes. At Frederick Street, Masonic Avenue continues around Buena Vista Park as an insignificant street. The main traffic route changes from Frederick Street to Ashbury Street, to Clayton Street and finally to Twin Peaks Boulevard before becoming Clarendon Avenue. In some residential areas, the road narrows to two lanes with six-foot sidewalks. Clarendon Avenue is discussed under secondary thoroughfares.

Consideration From Frederick Street to Clarendon Avenue, narrow sidewalks are a constraining factor. The microclimate is characterized by summer fog and westerly winds.

Existing Trees Fraxinus uhdei, Acacia melanoxylon and Ginkgo biloba occur most frequently with an equal distribution of other species including Tristania laurina, Metrosideros excelsus, Acacia longifolia, Myoporum laetum, Ceratonia siliqua, and Tristania conferta.

Recommendations There are many tree species planted along Masonic Avenue but none emerges as dominant. A single species should be selected to replace older plantings and eventually unify the streetscape.

Pine Street to Oak Street:

- Ginkgo biloba at 40 feet on center.

Oak to Frederick Street:

- Tristania conferta at 40 feet on center.

NINETEENTH AVENUE

Location From Lincoln Way to Junipero Serra Boulevard.

Description Nineteenth Avenue is a north-south street passing through the Sunset and Lake Merced Districts. Also known as State Route 1, it feeds into U.S. 280 at its southern end. From Lincoln Way and Sloat Boulevard, Nineteenth Avenue is six lanes wide with a raised six foot median. The sidewalks on the residential streets are twelve to fifteen feet wide.

Median width increases to 25-30 feet at Sloat Boulevard where it is used by the MUNI railway. Adjacent land uses are institutional and recreational but become residential again between Sloat Boulevard and Eucalyptus Drive. The frontage south of Eucalyptus Drive to Holloway Avenue is commercial and institutional on the west and multi-family residential on the east. South of San Francisco State University to the intersection with Junipero Serra Boulevard, Nineteenth Avenue is heavily planted with a mix of shrubs and trees.

Considerations Tall light standards are located in the median on Nineteenth Avenue. These are combined with MUNI tracks and overhead wires between Junipero Serra Boulevard and Eucalyptus Drive. Street tree plantings are also subject to fog, wind and cool temperatures.

Existing Trees Street tree plantings are sparse on Nineteenth Avenue between Sloat Boulevard and Golden Gate Park but increase south of Sloat.

Lincoln Way to Sloat Boulevard: Eucalyptus spp., Cupressus spp.

Sloat Boulevard to Eucalyptus Drive: Acacia melanoxylon, Ulmus pumila, Metrosideros excelsus.

From Eucalyptus Drive to Holloway Avenue: Eucalyptus spp., Pinus radiata, Acacia melanoxylon.

From Holloway Avenue to Junipero Serra Blvd.: Eucalyptus spp., Pinus radiata, Acacia melanoxylon.

Recommendations

Nineteenth Avenue is an important thoroughfare on a scenic route that connects U.S. 280 and Route 1 to the Golden Gate Bridge through Golden Gate Park. New plantings should be concentrated between Lincoln Way and Sloat Boulevard to link the green spaces of Golden Gate Park and Stern Grove.

North of Sloat:

- Eucalyptus ficifolia at 40 feet on center (sidwalks).
- Washingtonia robusta at 80 feet on center (median).

Accent plantings of Palms at Sloat Boulevard would strengthen the importance of this intersection.

South of Sloat Boulevard:

- Pinus radiata
- Eucalyptus spp.

The intersection of Nineteenth Avenue and Sloat Blvd. benefits from the great Eucalytus trees in Stern Grove.

NORTHPOINT STREET

Location	From The Embarcadero to Van Ness Avenue.
Description	Northpoint Street is a three-lane thoroughfare flanked by nine-foot sidewalks and two to four-story residential buildings with commercial uses at street level.
Existing Trees	Ficus microcarpa, Eucalyptus sideroxylon, Eucalyptus ficifolia, Pittosporum undulatum.
Recommendations	Tristania conferta at 40 feet on center.

OAK STREET

Location From Stanyan Street to Franklin Street.

Description Oak Street is the primary thoroughfare conveying traffic from Golden Gate Park to the Freeway or downtown. Its four eastbound lanes border the southern edge of the Panhandle between Baker Street and Stanyan Street. The two to three-story residential buildings are set back nine feet from the curb.

Considerations Overhead wires occur on the south side of the street.

Existing Trees Ficus microcarpa is the dominant Oak Street tree and is consistently planted on both sides of the street between Broderick and Franklin Streets. Podocarpus gracilior is also present in significant numbers.

Recommendations Tristania laurina at 30 feet on center between Stanyan Street and Van Ness.

Views of the Panhandle from adjacent residential buildings should be preserved.

OCEAN AVENUE

Location From Nineteenth Avenue to Mission Street.

Description The four lanes of Ocean Avenue traverse the Ingleside District. A relatively busy street, it is less travelled between Geneva and Mission Streets. Adjacent land use changes from single-family residential to commercial east of Cerritos Avenue. MUNI tracks are laid along the center.

Considerations Overhead MUNI wires and narrow sidewalks limit the choice of tree plantings. Intersections with special paving can be additionally enhanced by accent tree plantings.

Existing Trees There are no street trees between 19th Avenue and Victoria Street. East of Victoria Street are found Tristania conferta, Schinus terebinthifolius, Metrosideros excelsus, Ligustrum lucidum, and Pinus spp.

Recommendations Tristania conferta 40 feet on center.

The wide right-of-way along the commercial section of Ocean Ave. between Junipero Serra Blvd. and 19th Ave. should be planted with large street trees.

PARK PRESIDIO BOULEVARD

Location From Lake Street to Fulton Street.

Description Park Presidio Boulevard is part of the important street system linking I-280 in the south with Golden Gate Park and US-101 Golden Gate Bridge to the north. Its six traffic lanes are divided by a six-foot median and are flanked by 75 foot wide landscaped areas buffering the adjacent residential neighborhoods.

Considerations Travel speeds are relatively high for a City street.

Existing Trees The sides of the roadway are planted with Alnus spp., Pinus radiata, P. pinea, Cupressus macrocarpa, Acacia melanoxylon and Pittosporum eugenioides. The dense planting creates a forested effect.

Recommendations Interplant the right-of-way with native coastal species to renew the existing woodland. Plant Cedrus atlantica 'Glauca' randomly as a minor accent. Add deciduous and evergreen flowering trees and shrubs to provide seasonal accents, such as Magnolia campbellii, M. soulangiana and Leptospermum scoparium 'Red Damask'.

PINE STREET

Location From Market Street to Masonic Avenue.

Description Pine Street is a three-lane westbound thoroughfare that traverses the City from downtown through the Western Addition to the border of the Richmond District. The streetscape changes significantly as Pine Street passes through each district. Between Market and Kearny Streets are tall office buildings typical of the Financial District. From Kearny Street to Franklin Street, the predominant land use is multi-family residential with commercial establishments on the ground floor. Large-scale buildings occur at the intersections of Polk Street and Van Ness Avenue. From Franklin Street to Masonic Avenue, Pine Street is flanked by two to five story Victorian style apartments.

Considerations The tall office buildings east of Kearny cast shade and funnel westerly winds.

Existing Trees Market Street to Kearny Street: Ficus microcarpa.

From Kearny Street to Franklin Street: Ficus microcarpa, Eucalyptus sideroxylon, Olea europaea, Magnolia grandiflora.

From Franklin Street to Masonic Avenue: Olea europaea, Acacia melanoxylon, Ulmus parvifolia, Eucalyptus sideroxylon, Eucalyptus ficifolia, Maytenus boaria.

Recommendations Market Street to Kearny:

- Podocarpus gracilior at 30 feet on center.

From Kearny Street to Franklin:

- Olea europaea at 30 feet on center.
- Eucalyptus ficifolia at Van Ness (accent).

Franklin Street to Masonic Avenue, replace and interplant with:

- Olea europaea at 30 feet on center.
- Maytenus boaria at 20-25 feet on center.

PORTOLA DRIVE

Location From Market Street to Junipero Serra Boulevard.

Description Portola Drive is a six-lane wooded thoroughfare that links the downtown with the Lake Merced and Ingleside Districts. There is a planted median that varies from four to fifteen feet wide and little on-street parking. The neighborhood is primarily residential with a commercial node at Twin Peaks Boulevard. Mature trees modulate views to the east.

Considerations Additional tree plantings should not obscure views.

Existing Trees Trees occuring in both the median and planting areas adjacent to the sidewalk include: Pinus pinea, P. densiflora, Acacia melanoxylon, Pittosporum undulatum, Prunus cerasifera, and Myoporum laetum.

Recommendations Market Street to O'Shaughnessy Blvd.

- No plantings.

O'Shaughnessy Blvd. to Miraloma Drive:

- Pinus pinea (single stem) in center median.

Miraloma Drive to Sloat Boulevard:

- Pinus pinea and Eucalyptus ficifolia in median and parking strip.

POTRERO AVENUE

Location	From Brannan Street to Army Street.
Description	Potrero Avenue is a six-lane, north-south thoroughfare near the border of the Mission and Potrero Districts. From Brannan to 16th Street, adjacent land use is primarily industrial. South of 16th Street, industrial uses are mixed with commercial and residential development.
Considerations	The MUNI overhead wires on Potrero Street present a constraint for tree plantings.
Existing Trees	Ficus microcarpa and Magnolia grandiflora are dominant.
Recommendations	Magnolia grandiflora in vacant planting sites.

SANSOME STREET

Location From The Embarcadero to Market Street.

Description Sansome Street is a northbound thoroughfare consisting of two lanes with nine-foot wide sidewalks. Adjacent land uses are commercial offices. The base of Telegraph Hill borders Sansome Street on the west side.

Existing Trees Ficus microcarpa, Platanus acerifolia, Metrosideros excelsus, Pittosporum crassifolium.

Recommendations

- Platanus acerifolia at 40 feet on center (dominant).
- Ginkgo biloba at 40 feet on center south of Broadway (accent).

SKYLINE BOULEVARD

Location From Sloat Boulevard to the City and County line.

Description Skyline Boulevard (State Highway 35), a four-lane boulevard located in the southwest corner of the City, provides scenic views of Lake Merced and coastal dunes. A wide planted median enhances the boulevard's aesthetic qualities. An asphalt recreational trail, used by walkers, joggers and cyclists borders the eastside of the roadway.

Considerations North of John Muir Drive, the views from the roadway toward Lake Merced should be preserved. South of John Muir Drive, the road travels through a natural, wooded area. The microclimate is cool, windy and foggy most of the year.

Existing Trees The landscaping flanking Skyline Boulevard is a mixture of mature evergreens including Cupressus macrocarpa, Eucalyptus spp., Leptospermum laevigatum and Melaleuca nesophila.

Recommendations Maintain the random plantings of coastal conifers and broadleaf evergreens. Interplant with coastal shrubs such as Ceanothus spp. and Echium fastuosum. Coordinate the planting palette with any shoreline landscape improvements along Lake Merced.

SLOAT BOULEVARD

Location From the Great Highway to Junipero Serra Boulevard.

Description Sloat Boulevard is a six-lane thoroughfare which changes to four lanes with a center median east of Nineteenth Avenue. At Clearfield Drive, a concrete median separates the roadway from off-street parking. One and two-story residences are set back by a six-foot sidewalk.

Considerations Westerly winds and narrow sidewalks.

Existing Trees There are no street trees between the Great Highway and Sunset Boulevard near the Zoo. East of this point, Eucalyptus lehmannii and Cupressocyparis leylandii are planted in the center median.

Recommendations Sloat Boulevard is especially in need of street trees to screen Zoo parking areas.

From the Great Highway to Nineteenth Avenue:

- Washingtonia robusta in sidewalk widenings at intersections.

Center median:

- Eucalyptus lehmannii.

SOUTH VAN NESS AVENUE

Location	From Market Street to Army Street.
Description	South Van Ness Avenue is a four-lane thoroughfare oriented in a north-south direction through the Mission District. The roadway is bordered by nine-foot sidewalks. Adjacent land uses are primarily commercial on the east side and residential on the west.
Considerations	Views south to Bernal Heights should be preserved.
Existing Trees	Tristania conferta, Eucalyptus ficifolia, Cinnamomum camphora, Ligustrum lucidum and Grevillea robusta.
Recommendations	Tristania conferta at 40 feet on center.

THIRD STREET

Location From Market Street to Bayshore Boulevard.

Description Market Street to Townsend Street:
Third Street varies from three to four northwest-bound lanes leading directly Downtown. The predominant land uses are commercial and industrial, set back nine feet from the street. North of Harrison Street are views of the downtown high-rises. The Moscone Convention Center is located on the west side of Third Street between Folsom and Howard Streets.

Townsend Street to Galvez Avenue:
Third Street is four to six lanes in both directions separated by a four-foot median. It is in the far eastern part of the City and parallels the bay shoreline. Land uses are primarily industrial between Mission Creek and Galvez Avenue, changing to residential and neighborhood commercial.

Galvez Avenue to Bayshore Boulevard:
Third Street changes to residential and neighborhood commercial land uses south of Galvez Avenue, becoming more pedestrian oriented.

Existing Trees From Market Street to Townsend Street: Ficus microcarpa and Magnolia grandiflora.

From Townsend Street south to Bayshore Boulevard: Eucalyptus sideroxylon, Liquidambar stryaciflua, Acacia melanoxylon, Fraxinus uhdei and Metrosideros excelsus.

Recommendations Market to Townsend Street:

- Magnolia grandiflora at 40 feet on center.

Townsend Street to Galvez Avenue:

- Eucalyptus nicholii at 40 feet on center.

Galvez to Bayshore:

- Eucalyptus nicholii at 40 feet on center.

TOWNSEND STREET

Location From First Street to Fourth Street.

Description This four-lane section of Townsend Avenue is used by those traveling to the north, south and western sections of the City. Townsend Street borders the Caltrain Depot and is a primary bus route. Land uses consist primarily of commercial and industrial in three to five story brick buildings. A residential complex has recently been constructed at First Street.

Existing Trees There are few street trees on Townsend Street. Tristania conferta is being planted at the new residential development between First and Second Streets.

Recommendations

- Tristania conferta at 40 feet on center.

Intersection at The Embarcadero:

- Platanus acerifolia.

TURK STREET

Location From Market Street to Arguello Boulevard.

Description Turk Street consists of two to three westbound lanes which join Balboa Street at Arguello Boulevard. Sidewalks are twelve feet wide. Most buildings are two to three stories except between Leavenworth and Franklin Streets, where they exceed ten stories.

Existing Trees Ficus nitida, Pittosporum undulatum, Metrosideros excelsus and Eucalyptus ficifolia.

There are no trees in the Tenderloin between Market and Leavenworth on Turk Street.

Recommendations Pittosporum undulatum at 40 feet on center.

VAN NESS AVENUE

Location From Market Street to Northpoint Street.

Description Van Ness Avenue is a six-lane connector for U.S. 101. The ninety-three foot wide right-of-way includes parking, a twelve foot planted median and sixteen-foot sidewalks. Van Ness contains a mix of residential and commercial uses.

Considerations Van Ness passes through the Civic Center area.

Existing Trees Platanus acerifolia is the dominant sidewalk species on Van Ness Avenue. Ficus microcarpa and Acacia melanaxylon are also found in significant numbers. Eucalyptus spp. are planted in the center median.

Recommendations Sidewalk:

- Platanus acerifolia at 40 feet on center.

Median:

- Eucalyptus spp. randomly spaced.

SECONDARY THOROUGHFARES

BALBOA STREET

(From Arguello Boulevard to 25th Avenue)

Characteristics

- three lanes with parking
- twelve to fifteen-foot sidewalks
- two to three story multi-family residential
- commercial nodes at corners
- overhead wires
- ocean-influenced climate

Existing Trees

- Ficus microcarpa, Acacia melanoxylon, Metrosideros excelsus, Schinus terebinthifolius, Acacia longifolia.

Recommended Trees

Between 25th Avenue and Park Presidio Blvd:

- Eucalyptus nicholii or Metrosideros excelsus at 30 - 40 feet on center (dominant).
- Eucalyptus ficifolia at 40 feet on center (accent).

BOSWORTH STREET

(From O'Shaughnessy Boulevard to San Jose Avenue)

Characteristics
- two lanes with parking
- eight-foot sidewalks
- two to three-story residential apartments

Existing Trees Eucalyptus sideroxylon, Eucalyputus ficifolia, Tristania conferta, Myoporum laetum , Olea europaea.

Recommended Trees Tristania conferta at 40 feet on center.

CASTRO STREET

(From Waller Street to Market Street)

Characteristics

- two lanes with parking (extension of Divisadero Street)
- six to twelve-foot sidewalks
- residential Victorian-style architecture
- overhead wires

Existing Trees Tristania conferta, Pittosporum undulatum, Ficus microcarpa, Magnolia grandiflora 'Samuel Sommer'.

Recommended Trees Magnolia grandiflora 'Samuel Sommer' or Tristania conferta at 40 feet on center.

CLARENDON AVENUE

(From Seventeenth Street to Laguna Honda Boulevard)

Characteristics

- four lanes with four-foot paved median between UCSF Medical Center and Laguna Honda Hospital
- six to nine-foot sidewalks
- residential
- moderate to steep slopes with naturalized eucalyptus forest
- ocean views

Existing Trees

Acacia melanoxylon, Pittosporum undulatum, Umbellularia californica, Platanus acerifolia.

Recommended Trees

Sequoia sempervirens with an understory of California natives such as Ceanothus arboreus, Heteromeles arbutifolia planted randomly in the foregound of the naturalized forest.

Pinus spp. planted on west side of street to screen rear yards and fences.

CLIPPER STREET

(From Army Street along Church Street to Diamond Heights Boulevard)

Characteristics

- two lanes with parking
- twelve to fifteen-foot sidewalks
- residential Victorian-style architecture
- Bay views

Existing Trees

Acacia melanoxylon, Ficus microcarpa, Melaleuca nesophila, Metrosideros excelsus, Myoporum laetum.

Recommended Trees

Army Street to Douglass Street:

- Koelreuteria paniculata at 30 feet on center.

Douglass Street to Diamond Heights Boulevard:

- Eucalyptus spp. or Melaleuca quinquenervia.

Both Eucalyptus and Melaleuca tolerate the strong westerly winds that blow down Clipper Street.

DIAMOND HEIGHTS BOULEVARD

(From Clipper Street to Bosworth Street)

Characteristics

- four lanes with parking and four to twelve-foot planted median strip
- six to nine-foot sidewalks
- single-family detached residential
- panoramic views of the Bay and City

Existing Trees

Pinus radiata, Tristania conferta, Myoporum laetum, Metrosideros excelsus.

Recommended Trees

East side only:

- Tristania laurina.

West side only:

- Pinus radiata and Metrosideros excelsus.

Median:

- Rhamnus alaternus.

The street trees on Diamond Heights Blvd. were planted with federal funds.

DOLORES STREET

(From Market Street to San Jose Avenue)

Characteristics

- four-lane boulevard with parking and fifteen-foot wide planted median strip with landmark palm trees
- eighteen-foot sidewalks
- Victorian-style residential architecture

Existing Tree

Phoenix canariensis (median), Ficus microcarpa, Acacia melanoxylon, Magnolia grandiflora, Gingko biloba.

Recommended Trees

Sidewalk trees:

- Aesculus carnea at 40 feet on center.

Median:

- Phoenix canariensis.

EVANS AVENUE

(From Army Street to Hunters Point Boulevard)

Characteristics
- four lanes with parking and 18-foot wide planted median between Third Street and Hunters Point Boulevard
- six to nine-foot sidewalks
- light-industrial
- overhead wires

Existing Trees Acacia melanoxylon, Eucalyptus ficifolia, Acacia longifolia, Platanus acerifolia (median).

Recommended Trees Eucalyptus nicholii at 40 feet on center.

Eucalyptus nicholii, a large broadleaf evergreen tree, is recommended as a replacement and infill tree on Evans Avenue.

GREAT HIGHWAY

(From Point Lobos Avenue to Skyline Boulevard)

Characteristics

- four lanes with 10-foot median strip
- sand dunes with dune grasses
- strong winds, ocean-influenced climate
- ocean views

Existing Trees Cupressus macrocarpa and Myoporum laetum.

Recommended Trees Cupressus macrocarpa on leeward slopes of landscape area between Great Highway and Lower Great Highway.

GUERRERO STREET

(From Market Street to San Jose Avenue)

Characteristics
- four to six lanes with parking and narrow median with lights
- nine to twelve-foot sidewalks
- two to three story residential

Existing Trees Ficus microcarpa, Ligustrum lucidum, Geijera parviflora, Prunus cerasifera.

Recommended Trees Tristania laurina at 30 feet on center or Prunus cerasifera at 25 feet on center.

HUNTERS POINT BOULEVARD

(From Evans Avenue to Innes Avenue)

Characteristics

- four lanes with parking
- six-foot sidewalks
- overhead wires
- residential
- Bay views and Bay-influenced climate
- steep southeast facing slope on west side of road

Existing Trees Acacia melanoxylon

Recommended Trees Pittosporum undulatum and Washingtonia robusta alternating at 40 feet on center.

INDUSTRIAL STREET

(From Bayshore Boulevard to Oakdale Avenue)

Characteristics
- four lane with median
- twelve-foot sidewalks
- industrial
- overhead wires

Existing Trees Platanus acerifolia

Recommended Trees Ginkgo biloba at 40 feet on center.

INNES AVENUE

(From Hunters Point Boulevard to Donahue Street - Hunters Point Naval Shipyard)

Characteristics

- four lanes with parking and inconsistent narrow sidewalks on east side of road
- residential and commercial
- primary access route to naval shipyard
- overhead wires
- Bay views
- east-facing sloped open space

Existing Trees

Eucalyptus spp. (on hill), Pinus spp. (on hill), Washingtonia robusta.

Recommended Trees

- Washingtonia robusta on northeast side of street.
- Arecastrum romanzoffianum spaced to avoid overhead wires.
- Plant slope and southwest side of street with drought tolerant, low-maintenance, low-growing shrubs.

JAMESTOWN STREET

(From Salinas Avenue to Hunters Point Expressway)

Characteristics

- two lanes with parking
- four-foot sidewalks gradually increasing to four and then six lanes as it approaches Candlestick Park
- residential with landscaped setbacks
- Bay view at crest of street

Existing Trees

Pinus pinea, Myoporum laetum, Acacia longifolia, Eucalyptus spp.

Recommended Trees

- Casuarina stricta at 40 feet on center.
- Washingtonia robusta at 30 feet on center on the crest of the hill.

JOHN MUIR DRIVE

(From Skyline Boulevard to Lake Merced Boulevard)

Characteristics

- two lanes with parking and multi-use recreational path on lake side
- views to lake
- moderate slopes on west side with naturalized cypress and pine forest

Existing Trees

Eucalyptus spp., Cupressus macrocarpa and Pinus pinea planted on private golf course side.

Recommended Trees

A master plan is being prepared for the Lake Merced shoreline which will include planting recommendations.

MISSION STREET

(From The Embarcadero to the City and County Line)

From The Embarcadero to Duboce Avenue:

Characteristics
- four lanes with parking
- twelve to fifteen-foot sidewalks
- three to five story commercial/highrises east of First Street
- street furnishings and special pavement

Existing Trees Magnolia grandiflora, Metrosideros excelsus, Tristania conferta, Acacia longifolia, Ficus microcarpa.

Recommended Trees
- Magnolia grandiflora at 30 feet on center (dominant).
- Celtis sinensis at 40 feet on center (accent).

From Duboce Avenue to Army Street:

Characteristics
- four lanes with parking
- twelve-foot sidewalks
- mixed commercial with residential above
- colorful and textural streetscape

Existing Trees Platanus acerifolia, Ficus microcarpa, Washingtonia robusta, Pittosporum undulatum.

Recommended Trees
- Washingtonia robusta at 30 feet on center.
- Pittosporum undulatum interplanted as understory.

From Army Street to the City and County line:

Characteristics
- small-scale residential/commercial
- overhead wires
- views to hills
- four lanes with parking
- twelve-foot sidewalks

Existing Trees Schinus terebinthifolius (commercial areas) and Maytenus boaria (residential areas).

Recommended Trees
- Olea europaea at 25 - 30 feet on center.
- Acacia longifolia at 20 - 25 feet on center.

MONTEREY BOULEVARD

(From Santa Clara Avenue to I-280)

Characteristics

- nine-foot sidewalks with landscaped setback
- four lanes with parking and planted median strip
- single-family residential

Existing Trees

Pyrus calleryana (median), Eucalyptus sideroxylon, Tristania conferta, Cupaniopsis anacardioides, Metrosideros excelsus.

Recommended Trees

San Aleso Avenue to Plymouth:

- Eucalyptus nicholii at 40 feet on center.

Plymouth Avenue to I-80:

- Metrosideros excelsus at 30 feet on center.

Median:

- Melaleuca linarifolia or Callistemon viminalis at 25 feet on center.

There are currently no street tree plantings in the narrow sidewalks of the residential areas.

NORIEGA STREET

(From the Great Highway to 19th Avenue)

Characteristics

- two wide lanes with diagonal parking
- twelve-foot sidewalks
- two-story residential/commercial
- overhead wires
- ocean views

Existing Trees

Myoporum laetum, Tristania conferta, Eucalyptus spp., Acacia melanoxylon, Metrosideros excelsus.

Recommended Trees

- Eucalyptus nicholii interspersed with existing Metrosideros excelsus.
- Melaleuca linariifolia (accent).

OAKDALE STREET

(From Bayshore Boulevard to Third Street)

Characteristics

- three lanes with parking
- fifteen-foot sidewalks
- industrial
- overhead wires

Existing Trees

Acacia melanoxylon, Liriodendron tulipifera, Ficus microcarpa, Dodonaea viscosa.

Recommended Trees

Bayshore to Phelps Street:

- Fraxinus oxycarpa 'Raywood' at 40 feet on center.

Phelps Street to Third Street:

- Rhamnus alaternus at 20-30 feet on center.

O'SHAUGHNESSY BOULEVARD

(From Portola Drive to Bosworth Street)

Characteristics
- steep, curving two to four -lane road
- six-foot sidewalks
- Glen Canyon Park open space on north-east side

Existing Trees Tristania conferta, Eucalyptus ficifolia, Pinus spp. with Raphiolepis indica (shrub) in median.

Recommended Trees No additional trees are recommended.

SAN JOSE AVENUE

(From Guerrero Street to the City and County line)

Characteristics

- four lanes with parking and four-foot median
- nine to twelve-foot sidewalks
- residential with commercial nodes at corners
- freeway-like (six lanes) from Randall Street to Monterey Boulevard
- sparsely planted

Existing Trees

Tristania conferta, Eucalyptus polyanthemos, Acacia melanoxylon, Schinus terebinthifolius.

Recommended Trees

- Rhamnus alaternus (commercial nodes).
- Maytenus boaria (residential areas).

SANTA CLARA AVENUE

(From Portola Drive to Monterey Boulevard)

Characteristics
- two lanes with parking bordered by nine-foot planting strips and six-foot sidewalks
- large, single-family residences with landscaped setbacks

Existing Trees Eucalyptus spp. (mature)

Recommended Trees Matching Eucalyptus as replacement.

SEVENTH AVENUE

(From Lincoln Way to Laguna Honda Boulevard)

Characteristics

- four lanes with parking
- twelve-foot sidewalks
- residential with commercial node at Irving Street
- open space/reservoir (at Clarendon) and west-facing slopes of Mt. Sutro

Existing Trees

Ficus microcarpa, Eriobotrya deflexa, Maytenus boaria, Tristania conferta.

Recommended Trees

Lincoln Way to Lawton Street:

- Eriobotrya deflexa at 30 feet on center.

Lawton to Laguna Honda Boulevard:

- Native California understory (e.g., Heteromeles, Garrya) randomly planted in foreground of naturalized forest.

SEVENTEENTH STREET

(From Stanyan Street to Market Street)

Characteristics

- two lanes with parking and fifteen-foot sidewalks
- residential
- overhead wires
- Bay views

Existing Trees

Platanus acerifolia, Eucalyptus ficifolia, Metrosideros excelsus, Acacia melanoxylon.

Recommended Trees

From Stanyan Street to Clayton Street:

- Metrosideros excelsus at 30 to 40 feet on center.

From Clayton Street to Market Street:

- Metrosideros excelsus at 30 to 40 feet on center.

SILVER AVENUE

(From Bayshore Boulevard to Oakdale Street)

Characteristics

- two lanes with parking and ninefoot sidewalks
- residential
- Bay views from hill crest at Scotia Avenue
- overhead wires on north side

Existing Trees

Callistemon citrinus, Myoporum laetum, Jacaranda mimosifolia.

Fewer than ten trees on street. None are dominant.

Recommended Trees

Jacaranda mimosifolia at 40 feet on center.

STANYAN STREET

(From Fulton Street to 17th Street)

Characteristics

- four lanes changing to two lanes south of Parnassus Avenue
- six to nine-foot sidewalk
- institutional/commercial land uses north of Fell Street
- residential with neighborhood commercial between Oak and 17th Streets
- Golden Gate Park on west side
- overhead wires
- residential from Oak Street to Seventeenth Street

Existing Trees

Eucalyptus ficifolia, Ficus microcarpa, Magnolia grandiflora, Liquidambar styraciflua, Maytenus boaria, Pittosporum undulatum.

Recommended Trees

Oak Street to Seventeenth Street:

- Ginkgo biloba at 40 feet on center.

Turk Street between Oak and 17th Streets to Oak Street:

- Eucalyptus ficifolia at 40 feet on center.

SUNSET BOULEVARD

(From Lincoln Way to Lake Merced)

Characteristics

- six lanes divided by a twelve-foot planted median
- residential on adjacent streets
- wide landscaped areas create parkway effect
- ocean-influenced climate

Existing Trees

Acacia melanoxylon, Metrosideros excelsus, Platanus acerifolia.

Recommended Trees

- Pinus pinea, Pinus radiata and Cupressus macrocarpa planted randomly to reforest right-of-way.
- Magnolia soulangiana, Pittosporum spp., Rhamnus alaternus, Arbutus unedo for understory accents.

TARAVAL STREET

(From Sunset Boulevard to Dewey Boulevard)

Characteristics

- two lanes with parking
- three-foot planting strip and nine-foot sidewalks
- commercial with residential above between 12th Avenue and Dewey Boulevard
- overhead wires
- ocean views
- sparsely planted west of 23rd Avenue

Existing Trees

Myoporum laetum, Metrosideros tomentosa, Pittosporum undulatum.

Recommended Trees

- Tristania conferta or T. laurina at 30 feet on center (commercial areas).
- Rhamnus alaternus at 20 to 25 feet on center (residential areas).

VALENCIA STREET

(From Army Street to Market Street)

Characteristics	- four lanes with parallel parking - residential and commercial uses with commercial node at 16th Street - ten-foot sidewalk
Existing Trees	Ficus microcarpa, Platanus acerifolia, Maytenus boaria, Tristania conferta.
Recommended Trees	Infill with Platanus acerifolia, Maytenus boaria and Tristania conferta.

VICENTE STREET

(From 19th Avenue to Portola Drive)

Characteristics

- two lanes with parking
- planting strip plus nine-foot sidewalk
- residential with commercial node near Portola Drive

Existing Trees

Platanus acerifolia (commercial area), Acacia melanoxylon, Eucalyptus ficifolia.

Recommended Trees

- Tristania conferta in commercial area at 40 feet on center.
- Rhamnus alaternus in residential areas and at school locations at 20 to 25 feet on center.

WOODSIDE AVENUE

(From Laguna Honda Boulevard to Portola Drive)

Characteristics	- four lanes with parking and six-foot sidewalks - residential land uses with commercial nodes - institutional land uses on north side
Existing Trees	Naturalized landscape at Laguna Honda Hospital; ornamental landscaping in residential setbacks (front yards).
Recommended Trees	Prunus serrulata 'Kwanzan' at 20 to 25 feet on center.

The downtown streets occur within the general area bounded by The Embarcadero on the north and east, Townsend Street on the south, and Franklin Street on the west (see Figure 5). These boundaries encompass the Downtown and South of Market districts. Many of the streets continue outside of this area into other districts and have been previously described. Streets of similar character, cross-section, land use, and/or vegetation have been grouped rather than assessed individually.

DOWNTOWN INSET

LEGEND

FREEWAY

MAJOR THOROUGHFARES IN THE DOWNTOWN AREA

SITE MAP

Figure 5

FREMONT STREET, FIRST STREET

(From Market to Harrison Street)

Characteristics

- four lanes with parking
- twelve-foot sidewalks, many with special paving
- high-rise office buildings
- overhead MUNI wires
- minimal solar access and frequent winds

Existing Trees

The existing trees are furnished with tree grates and guards or are in planters. Species include: Ficus microcarpa, Ceratonia siliqua, Pittosporum undulatum, Metrosideros excelsus.

Recommended Trees

- Ceratonia siliqua at 20 to 25 feet on center.
- Metrosideros excelsus at 30 feet on center.

THIRD STREET AND FOURTH STREET

(From Market Street to Townsend Street)

Characteristics
- four lanes (one direction) with parking
- industrial land uses between Townsend and Harrison Streets
- commercial office/retail from Harrison Street to Market Street
- nine to fifteen-foot sidewalks

Existing Trees Magnolia grandiflora, Ficus microcarpa, Platanus acerifolia.

Recommended Trees Magnolia grandiflora at 30 feet on center.

FIFTH AND SIXTH STREETS

(From Market to Bryant Streets)

Characteristics

- two lanes in both directions with limited parking
- nine-foot sidewalks
- three to five story commercial with residential above
- between Mission and Market Streets, the streetscape relates more to the Downtown District (north of Market)
- freeway access to I-280 and from I-80

Existing Trees Ficus microcarpa, Magnolia grandiflora, Ginkgo biloba.

Recommended Trees Ginkgo biloba and Tilia cordata alternating in groups of three at 30 feet on center.

SEVENTH, EIGHTH, NINTH AND TENTH STREETS

(From Market Street to Bryant Street)

Characteristics

- four lanes, one direction with parking
- nine-foot sidewalks widen to twelve feet between Market Street and Mission Street
- commercial/light industrial land uses
- two to five stories
- primary freeway access and egress

Existing Trees

Ficus microcarpa, Pittosporum undulatum, Tristania conferta, Eucalyptus ficifolia, Metrosideros excelsus, Ligustrum lucidum, Ginkgo biloba, Acacia melanoxylon, Platanus acerifolia.

Recommended Trees

- Ligustrum lucidum or Metrosideros excelsus at 30 feet on center midblock.
- Ginkgo biloba 30 feet on center at intersections.

HOWARD STREET AND FOLSOM STREET

(From The Embarcadero to 13th Street)

Characteristics

- four lanes oriented northeast-southwest with parking
- nine-foot sidewalks
- commercial/light industrial
- overflow of Financial District character (high-rise offices) between Main and Fourth Street
- south sides of streets are in shade
- overhead MUNI wires on Howard Street

Existing Trees

Ficus microcarpa, Tristania conferta, Schinus terebinthifolius, Magnolia grandiflora, Populus fremontii, Platanus acerifolia, Fraxinus uhdei, Pittosporum undulatum, P. crassifolium.

Recommended Trees

Howard Street:

- Platanus acerifolia at 40 feet on center.

Folsom Street:

- Tristania conferta at 30 feet on center.

MONTGOMERY STREET AND KEARNY STREET

(From Market Street to Columbus Avenue)

Characteristics

- three lanes with parking
- twelve to fifteen-foot sidewalks
- commercial retail/office buildings
- prevailing shade and winds

Existing Trees

Ficus microcarpa, Platanus acerifolia, Populus nigra 'Italica' and Pittosporum spp. at Portsmouth Square.

Recommended Trees

Montgomery Street:

- Pittosporum undulatum at 30 feet on center.

Kearny Street:

- Pittosporum undulatum at 25 to 30 feet on center.

POWELL STREET

(From Washington Street to Market Street)

Characteristics

- two-lane north-south thoroughfare with cable car tracks
- nine-foot sidewalks
- transportation node at Market Street (cable car terminus, BART and MUNI)
- primarily residential north and commercial retail south of Sutter Street
- landmarks include Union Square, Nob Hill

Existing Trees Metrosideros excelsus, Pittosporum crassifolium, Ficus microcarpa in containers.

Recommended Trees Metrosideros excelsus at 30 feet on center.

JONES, LEAVENWORTH, HYDE AND LARKIN STREETS

(From Broadway to Market Street)

Characteristics

- north-south thoroughfares (traffic patterns change at California Street)
- twelve to fifteen-foot sidewalks
- residential land uses are dominant north of Geary
- commercial and Civic Center activities are dominant between Geary and Market Streets
- architecturally significant structures

Existing Trees

Jones Street: Acacia melanoxylon, Magnolia grandiflora, Myoporum laetum, Ligustrum lucidum, Platanus acerifolia, Maytenus boaria.

Leavenworth Street: Olea europaea, Acacia longifolia, Eucalyptus ficifolia, Ceratonia siliqua.

Hyde Street: Ficus microcarpa, Pittosporum crassifolium, Pittosporum undulatum, Schinus terebinthifolius, Tristania conferta, Ulmus parvifolia, Pyrus kawakamii, Metrosideros excelsus.

Larkin Street: Grevillea robusta, Arecastrum romanzoffianum.

Recommended Trees

Jones Street:

- Magnolia grandilora or Platanus acerifolia at 30 feet on center.

Leavenworth Street:

- Eucalyptus ficifolia, Metrosideros excelsus, or Olea europaea at 30 feet on center.

Hyde Street and Larkin Street:

- Metrosideros excelsus or Tristania conferta at 30 feet on center.

MASON STREET

(From Broadway to California Street)

Characteristics

- two-lane northbound with parking
- six to nine-foot sidewalks
- residential with neighborhood commercial
- Cable Car Museum and Chinese Recreation Center at Washington Street
- tourist area
- Bayviews

Existing Trees

Platanus acerifolia, Ficus microcarpa, Pittosporum undulatum, Metrosideros excelsus, Eriobotrya deflexa.

Recommended Trees

- Pittosporum undulatum at 30 feet on center to frame views.
- Ginkgo biloba at 30 feet on center at the Washington Street intersection.

WASHINGTON STREET

(From Franklin Street to The Embarcadero)

Characteristics

- east-west thoroughfare with parking, changes direction at Powell Street
- nine-foot sidewalks increasing to fifteen feet west of Powell Street
- Chinatown between Powell Street and Kearny Street
- commercial land uses east of Stockton, primarily three to five story residential west of Powell Street
- Cable Car line between Hyde and Powell Streets
- views to downtown and Bay Bridge at Larkin Street

Existing Trees

Ficus microcarpa, Pittosporum undulatum, Magnolia grandiflora, Tristania conferta, Metrosideros tomentosa, Platanus acerifolia, Eucalyptus.

Recommended Trees

- Tristania conferta or Magnolia grandilfora at 30 feet on center in Chinatown.
- Ginkgo biloba at 30 feet on center.

CLAY STREET

(From Franklin Street to Drumm Street)

Characteristics

- two lanes with parking
- residential west of Stockton, commercial east of Grant
- commercial node at Van Ness
- views to downtown at Larkin Street

Existing Trees

Ficus microcarpa, Platanus acerifolia, Pittosporum undulatum, Metrosideros excelsus, Ulmus parvifolia.

Recommended Trees

Franklin to Mason Street:

- Ginkgo biloba at 30 feet on center.

Mason to Drumm Street:

- Tristania conferta at 30 feet on center.

POST, GEARY AND O'FARRELL STREETS

(From Franklin Street to Market Street)

Characteristics

- three lanes, one direction with parking
- major east-west thoroughfares
- twelve-foot sidewalks
- four to six story commercial at street level with residential above west of Mason Street
- high-rise commercial retail/office east of Mason Street
- landmarks include Union Square
- heavy pedestrian traffic

Existing Trees

Platanus acerifolia, Tristania conferta, Ficus microcarpa, Pittosporum undulatum, Metrosideros tomentosa, Acacia melanoxylon.

Recommended Trees

- Tristania conferta, Metrosideros tomentosa, Tristania laurina or Pyrus calleryana at 30 feet on center.

Note: Avoid conflicts with awnings and street lights.

McALLISTER STREET

(From Franklin Street to Leavenworth Street)

Characteristics
- three lane east-west thoroughfare
- runs through Civic Center area

Existing Trees Pittosporum undulatum, Tristania conferta, Platanus acerifolia.

Recommended Trees
- Tristania conferta at 30 feet on center between Franklin Street and Van Ness.
- Platanus acerifolia at 30 feet on center from Van Ness to Leavenworth.

Note: Persistent shade on south side of street between Larkin and Leavenworth.

TREES FOR SITE DEVELOPMENT

Introduction

Plantings located in areas outside the public rights of way form an important part of the urban forest. Aesthetic and utilitarian opportunities with off-street tree plantings are considerable. Moreover, the cost of planting and maintaining off-street trees is generally less than for street trees. Streets trees can require tree basins and/or grates, and their roots crack and lift sidewalks, leading to costly repairs. Pruning is done less frequently on off-street rather than street trees, whose limbs can interfere with buildings, overhead wires and signs.

Tree Types

For tree plantings in an urban setting to be successful, it is essential that the proposed trees be desired and useful to City residents. If a tree serves no useful purpose, it will not receive the required care, particularly during the critical first three years of establishment.

Trees can be used in a number of ways or patterns that respond to and reflect basic human needs. Such patterns, referred to as tree types, have certain physical and aesthetic characteristics that make them desirable components of the urban forest. Each can also serve various utilitarian functions, depending upon the scale of the specific plantings.

Taken as a whole, the five tree types described below express the complex and varied manner tree plantings can serve and inspire the urban population.

Avenue. The street tree plantings which are the focus of most of The Trees of San Francisco are an excellent example of avenue plantings and are characterized by a single or double row of trees on each side of a path or roadway. Examples of avenue plantings at the scale of a major thoroughfare include Dolores Street (sidewalk planting of primarily Ficus nitida with a median planting of Phoenix canariensis), Market Street (double sidewalk rows of Platanus acerifolia) and California Street (Platanus acerifolia). Neighborhoods with extensive avenue plantings include Pacific Heights and portions of the Buena Vista District.

A grove of Monterey Cypress in the Presidio form an outdoor cathedral.

Grove. A grove is a grouping of trees smaller than a forest and often without a shrub undergrowth layer. They can occur in naturalistic formations or in regularly spaced rows, as in orchards. Certain trees, such as Eucalyptus and Lyonothamnus (Catalina Ironwood) are particularly well-suited to this kind of planting. Groves in naturalistic groupings include Stern Grove in the Sunset District, and stands of redwood and Coast Live Oak in the northeast corner of Golden Gate Park.

Single Specimen. The image of the lone, open-grown tree is one that is most evocative for many people. It is often the best expression of the individual specimen's unique aesthetic qualities as well as the effects of time. Typical trees of this type in San Francisco include Monterey Cypress, Monterey Pine and Italian Stone Pine.

The Monterey Cypress in front of McLaren Lodge in Golden Gate Park sparkles with lights during the holiday season.

Hedgerow. Generally associated with rural agricultural areas, hedgerows are rows of trees (often with a shrub understory) used as windbreaks and spatial enclosures. They function well at several urban scales.

On a residential scale, hedgerows define and enclose residential properties while modifying views and climatic conditions. They can form magnificent spaces at the neighborhood scale, particularly in public parks. The play fields at Crocker Amazon, for example, are beautifully enclosed by hedgerows of Eucalyptus.

Hedgerow of Eucalypts at Crocker Amazon Playground. Hedgerows are effective windbreaks in the City.

Hedgerows also are valuable form-givers at the district level. A good example of this can be seen in the use of Monterey Pine and Cypress along Sunset Boulevard in the Sunset District. The mixed planting of coniferous and broadleaf evergreen trees and shrubs along Presidio Boulevard in the Richmond District offers another.

Forest. Forests are extensive communities of trees and shrubs in all stages of growth and decay. Like hedgerows, they are useful as windbreaks and spatial enclosures. They are also places where one can choose to feel "lost", apart from the rhythms of urban life.

Forests are often places suggestive of a primeval nature far removed from human society.

The basis of a comprehensive urban forestry concept, forests provide the well-spring of natural processes from which other components of urban tree planting are drawn. These components, consisting of the four previous tree types, are more highly maintained and may perhaps be viewed as the "civilized" forest.

Although San Francisco originally had little tree cover, it is now blessed with numerous large public open areas which have been densely planted with trees. Outstanding examples include Golden Gate Park, the Presidio, and many hillside parks scattered throughout the City.

Design Guidelines

In general, the urban forest is most effective when seen as an architectural framework for shaping open spaces, parks, streets and gardens for public and private use. Trees can form "outdoor rooms" and spaces in two ways:

1. They can be planted as walls of varying thickness and transparency, creating enclosed outdoor areas of a definite shape. Avenues, groves, hedgerows and forests work well in creating this type of structure.

2. Trees shape spaces by creating an overhead canopy or ceiling and modulating the ground and space below with the trunk(s) which support it. All five tree types can form landscapes in this manner.

Using a combination of tree types heightens the aesthetic qualities of each. The complex of cultural facilities surrounding the Music Concourse in Golden Gate Park contains an excellent variety of outdoor spaces created with this kind of broad selection.

Trees for Public Lands

There are numerous public agencies and private organizations involved in the planning and maintenance of trees planted on public lands. The Trees of San Francisco encourages the vision of a rich and varied urban forest for public open spaces, especially on lands used for recreation, education, health or housing. Opportunities for implementing the full range of tree types are considerable, requiring a concerted effort by all interested citizens.

Monterey Pines enclose a playground at Alta Plaza. Trees are an excellent way of shaping outdoor space for various uses.

URBAN FORESTRY DISTRICTS

The Urban Forestry Districts have been developed to identify opportunities for tree plantings, particularly street trees, in a format corresponding to San Francisco's urban form. By aligning the Management Plan with the District concept, the Plan should also be of use to District and neighborhood associations in planning tree plantings.

Each District is described in terms of location, size, general land uses, major and secondary thoroughfares, neighborhoods, open space and natural factors. In general, recommendations address:

- improving the aesthetic quality of thoroughfares and neighborhood streets, particularly when a District has limited public open space.
- re-inforcing neighborhood identity and enhancing livability.
- mitigating climatic factors, especially winds.
- preserving existing views.

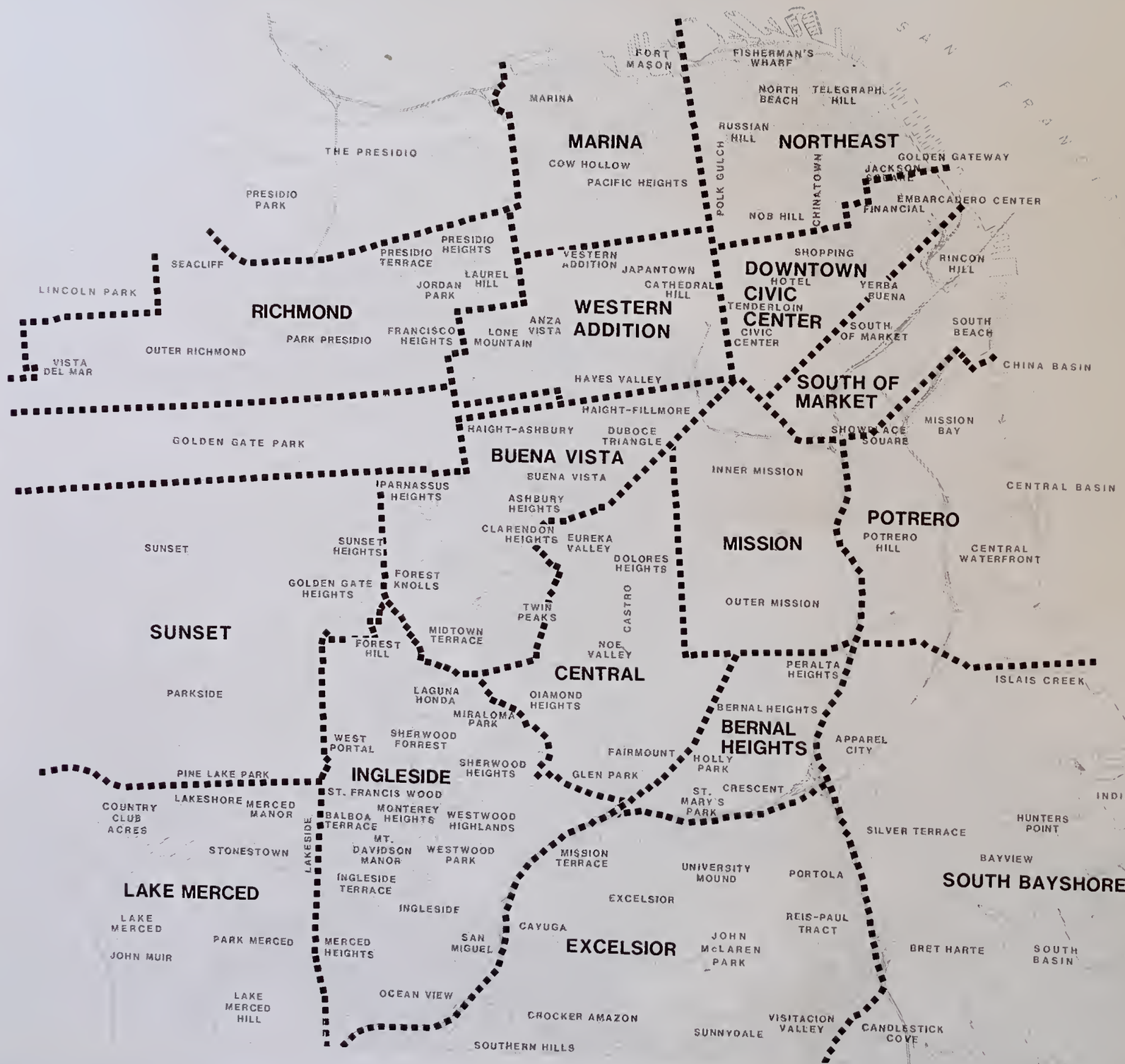
District maps indicate the location and distribution of primary commercial areas, public open spaces, points of interest, major and secondary thoroughfares and freeways, overlain on a base map showing the street grid and topography. The commercial areas have been derived from the Department of City Planning's neighborhood commercial land use designations. Specific tree species recommendations are given for each commercial area (see 'The San Francisco Tree Matrix' in the Appendix for species descriptions).

DISTRICTS

LEGEND

■ ■ ■ DISTRICT BOUNDARY

NOB HILL NEIGHBORHOOD



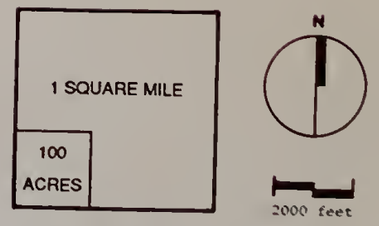


Figure 6

BERNAL HEIGHTS DISTRICT

Description and Urban Form

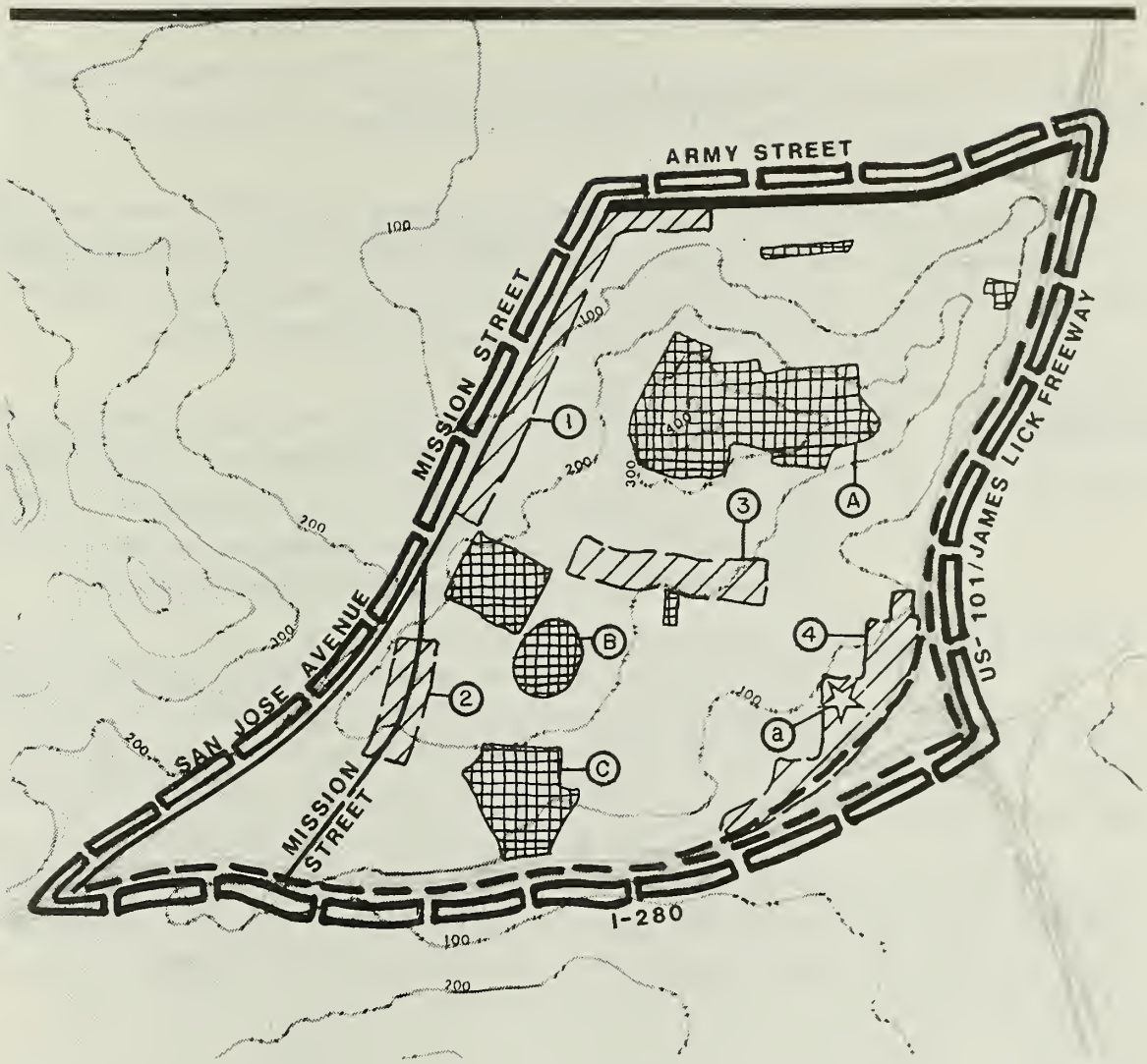
Location and Size. The Bernal Heights District is located in the south central section of the City, north of the Excelsior District. It is the smallest district in San Francisco, extending over 690 acres or 1.1 square miles. Two major regional transportation corridors, highways I-280 and U.S. 101 (James Lick Freeway), form the southern and eastern edges. Mission Street/San Jose Avenue and Army Street define the western and northern boundaries. Streets are laid out on several differently aligned grids, influenced in part by the district's varied topography.

Land Uses. Bernal Heights is primarily a low to medium density residential district with four commercial nodes: two along Mission Street (1,2), one centrally located along Cortland Avenue (3), and the largest commercial node along Alemany Boulevard (4), west of the I-280 and U.S. 101 (James Lick Freeway) junction. The Alemany Farmer's Market (a) is adjacent to this latter commercial area.

Thoroughfares. Although Bernal Heights is bounded by major streets and freeways, Mission Street is the only significant thoroughfare passing through the district.

Neighborhoods and Open Space. Holly Park, Peralta Heights, St. Mary's Park and Crescent are residential neighborhoods characterized by small stucco homes with tile roofs. The neighborhood of Bernal Heights has a more eclectic mix of stucco flats, 19th and 20th century wood-sided homes, and contempo-

St. Mary's Park. Trees with spreading canopies (e.g. Eucalyptus ficifolia) may be planted in wide building setbacks.



LEGEND

- DISTRICT BOUNDARY
- COMMERCIAL AREA (1)
- OPEN SPACE (A)
- POINT OF INTEREST (a)
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 7

rary-styled buildings. It is noted for its excellent views of Downtown, San Francisco Bay, and the Noe Valley area.

The Bernal Heights District has a considerable amount of public open space. Bernal Heights Park (A), Holly Park (B), and St. Mary's Park (C) are large parks located along the ridgeline traversing the district in a northeasterly direction.

Natural Factors

Bernal Heights lies predominantly in climatic Zone 3. Its climate is typified by warm to hot temperatures and dry clear skies. The district is generally protected from strong coastal winds by the Diamond Heights hills; however, strong winds are channeled through the valley along the district's southern edge.

Bernal Heights' primary topographic feature is the hill comprising Bernal Heights Park, which crests in the northern half of the district. The hill rises over 350 feet, with steep slopes on its north, west and east faces. Neighborhoods on these slopes have excellent views of the Central and Mission Districts. The more gently sloping hills in the southern portion of the district fall toward the lowlands bordering I-280. Hillside residents in this area overlook the northern slopes of the Excelsior District.

Northern view from Bernal Heights.

The soils of Bernal Heights are composed of clayey to sandy loam and provide a well-draining, fertile planting medium.

General Recommendations

Views should be preserved in hillside residential areas by using small trees or medium-sized, open-canopied trees. Neighborhoods should be distinguished with distinctive tree plantings. Windbreaks should be provided along the district's southern edge. Interstate-280 and the adjacent large parking lot should be screened with fast growing evergreens. High traffic volumes on Mission Street, San Jose Avenue and Army Street should be screened with medium to large evergreens.

Commercial Recommendations

1. Mission Street: Pittosporum undulatum at 30 feet o.c.
2. Cortland Avenue: Agonis flexuosa at 20 to 25 feet o.c.
3. Farmer's Market: Eucalyptus nicholii at 30 to 40 feet o.c.

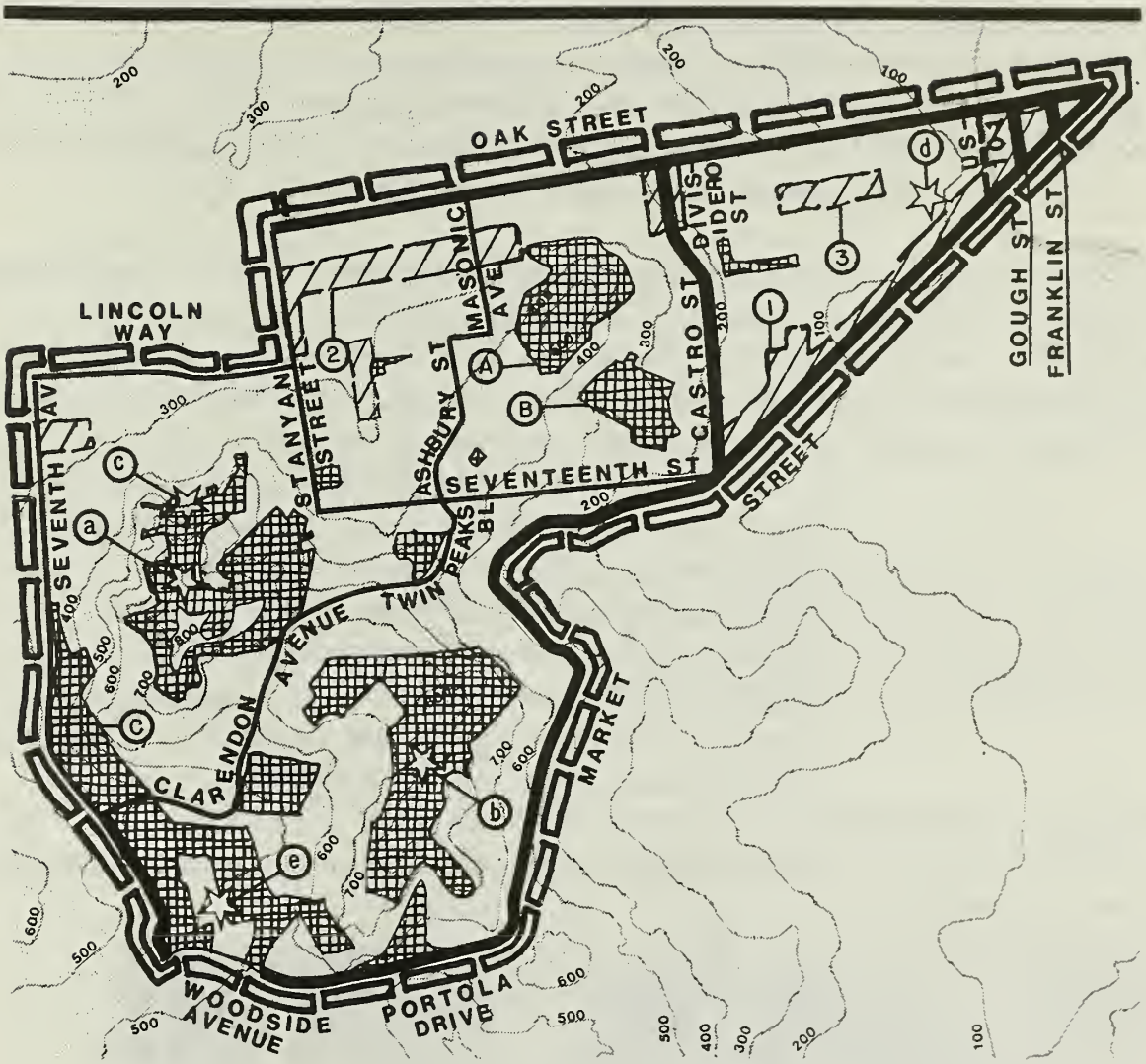
BUENA VISTA DISTRICT

Description and Urban Form

Location and Size. Located in the center of San Francisco, the Buena Vista District is a moderately-sized district of 1620 acres or 2.5 square miles. Its name and general character are derived from the several prominent hills located within its boundaries; Buena Vista Hill (A), Mount Sutro (a), and Twin Peaks (b) provide magnificent views of all parts of the City and the San Francisco Bay Area.

Land Uses. Buena Vista generally consists of low-density, single-family residential neighborhoods with some medium to moderately-high residential densities in the district's northeast corner. Commercial nodes are located along Market Street (1) and Haight Street (2, 3). Major institutional facilities include the University of California Medical Center (c), University of California Extension (d), and Laguna Honda Home (e). An additional point of interest is the transmission tower atop Mount Sutro, which can be seen from as far away as the East Bay.

Buena Vista Park. A reforestation program was a major element in the park's 1987 master plan.



LEGEND

- DISTRICT BOUNDARY
- COMMERCIAL AREA (1)
- OPEN SPACE (A)
- POINT OF INTEREST (a)
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 8

Thoroughfares. Most of Buena Vista's major thoroughfares define its edges. Oak Street serves as a major feeder onto the Central Skyway (U.S. 101). Castro/Divisadero Street is the only major thoroughfare crossing through the district.

Neighborhoods and Open Space. The Buena Vista District is composed of numerous neighborhoods, many of which are described by topographic features: Ashbury Heights, Buena Vista Hill, Clarendon Heights, Corona Heights, Twin Peaks, Parnassus Heights, Mount Olympus, Mint Hill and Midtown Terrace. Flatland neighborhoods are described by prominent local streets: Haight-Ashbury, and the Duboce Triangle. Most residential neighborhoods consist of a variety of architectural styles and types: Victorians, brown shingles, Modern and Art Deco apartments, Baroque mansions and Mediterranean-style single-family residences. Midtown Terrace, an 800 unit multi-family development west of Twin Peaks, is one of the newer large-scale residential developments in San Francisco.

The Buena Vista District is rich in open space areas, including

Noe St. in the Duboce Triangle has wide, landscaped sidewalks encouraging pedestrian activity.

Twin Peaks, Mount Sutro and the 7th Avenue watershed (C). Two large parks are located along the ridge line: Buena Vista Park (A) and Corona Heights Park (B). Grattan Playground, Midtown Terrace Recreation Center, and Duboce Park provide neighborhood recreational opportunities.

Natural Factors

The Buena Vista District spans both coastal and transitional climate zones. Extreme variations in topography, ranging from panoramic summits to low flatlands, influence westerly wind patterns. Coastal winds are strongest on the upper northern and western slopes; east-facing slopes and leeward valleys are more protected.

The fertile soils spreading over the Buena Vista area offer a rich planting medium. Sandy soils occur in the lowlands along the district borders. Interspersed clay and loam lie along the central hill area and a finger of clayey-loam runs along the southeastern corner.

General Recommendations

Views should be preserved in hillside residential areas. Windbreaks should be established where they do not conflict with views. The aesthetic character along transportation corridors, e.g., Portola Drive, Oak Street and Market Street, should be improved with medium to large trees.

Commercial Recommendations

1. Market Street: Platanus acerifolia at 40 feet o.c.

2. Haight Street: Tristania conferta or Hymenosporum flavum at 30 feet o.c. and Pyrus kawakamii at 20 to 25 feet o.c.

3. Lower Haight: Tristania conferta or Hymenosporum flavum at 30 feet o.c.

4. Cole Street: Alternating groupings (3 trees minimum/group) of Tristania laurina at 25 to 30 feet o.c. and Callistemon viminalis at 20 to 25 feet o.c.

CENTRAL DISTRICT

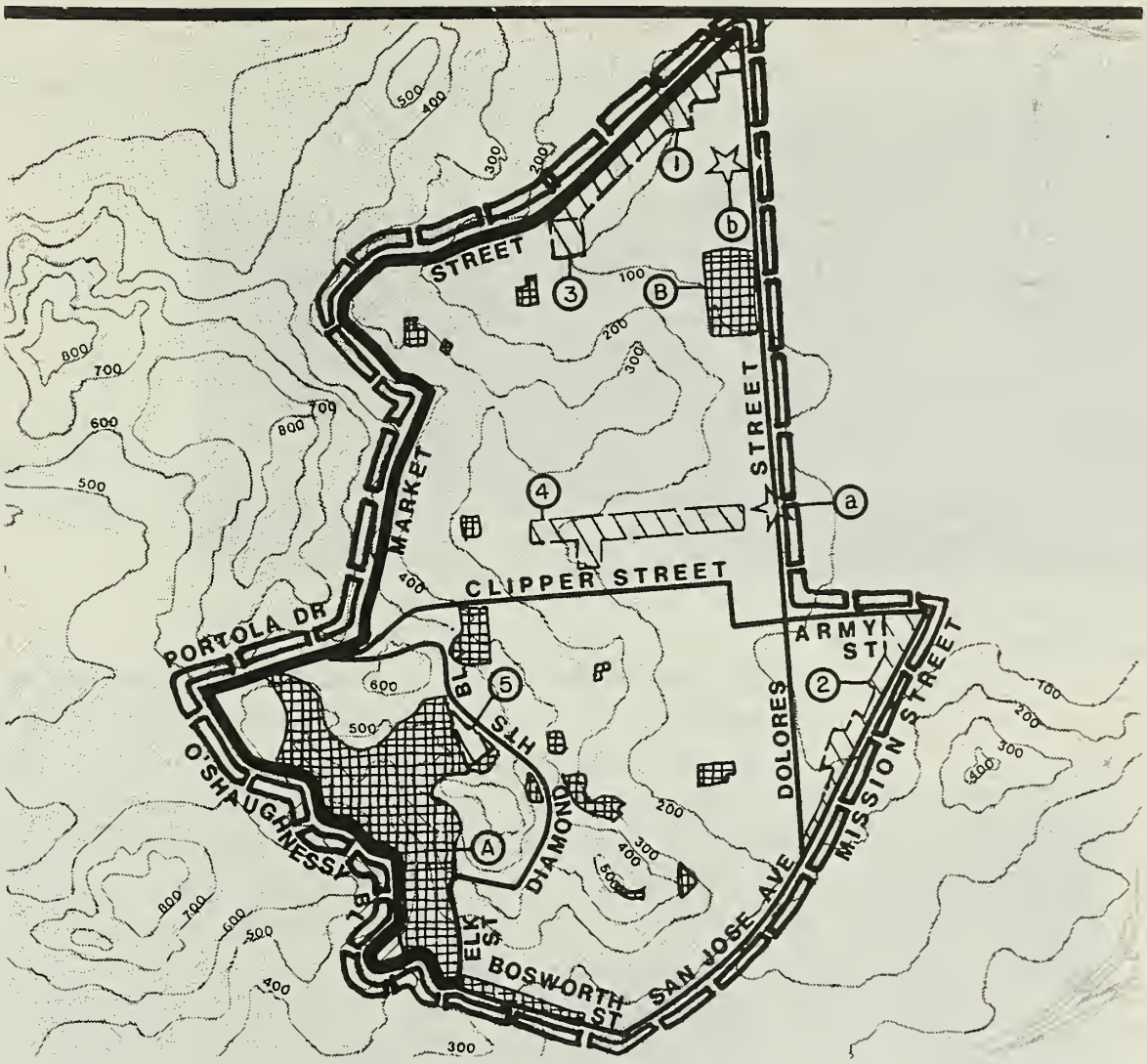
Description and Urban Form

Location and Size. Lying at the geographic center of the city, the Central District extends over approximately 1470 acres or 2.4 square miles. Like the Buena Vista District to the north, the Central District's geographic form and visual character are shaped by San Francisco's central hill range, which define the Central District's undulating southern and western edge. The district's northern and eastern boundaries are defined by streets: Market Street to the north and Dolores, Army and Mission Streets to the east.

Land Uses. The Central District is composed primarily of low to moderately-low residential development. Moderately-high residential densities occur along Dolores Street, Market Street, portions of 24th Street and Diamond Heights Boulevard. A small pocket of high-density residential development occurs in the Diamond Heights neighborhood. The district has many vibrant shopping areas: Upper Market Street (1), Mission Street (2), Castro Street (3), and 24th Street (4). Several small neighborhood commercial areas are located on Church Street south of 24th Street.

Thoroughfares. Most of Central's major thoroughfares occur along its irregularly-shaped boundaries: Market Street, Portola Drive and O'Shaughnessy Boulevard to the west; Bosworth Street and San Jose Avenue to the south; and Mission, Army and Dolores Streets to the west. Three secondary thoroughfares (Clipper Street, Diamond Heights Boulevard and portions of Dolores Street) cross through the southern half of the district.

Neighborhoods and Open Space. The Central District is composed of seven residential neighborhoods. Eureka Valley, Dolores Heights, Castro Village, and Noe Valley are located on the more gentle foothill slopes where streets follow a regular grid. Diamond Heights, Glen Park and Fairmont are hillside communities in the district's southern section. Glen Park and Fairmont are mostly composed of older homes with a distinctly rural charm. Diamond Heights is a recently built development conveniently located near a neighborhood shopping center (5).



LEGEND

- DISTRICT BOUNDARY
- 1 COMMERCIAL AREA
- A OPEN SPACE
- a POINT OF INTEREST
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 9

The forested canyon in Glen Park is one of the City's few large natural open spaces.

The Central District is rich in open space facilities, ranging from wooded canyons to mini-parks. Glen Park Canyon (A) is a large 70 acre undeveloped area complemented by a recreation center and playground. Mission Dolores Park (B) is a well-known urban park frequented by residents from both the Central and Mission Districts. The Canary Island Date Palms (a) along Dolores Street and Mission Dolores (b) provide a strong community image.

The Palms in Dolores Park combine effectivively with the Palms in the landscape median on Dolores Street.

Natural Factors

Primarily located in San Francisco's transitional climate zone, the Central District's climate is strongly influenced by the central hills to the west. Low-lying neighborhoods on the east side of the peaks are protected from winds and have less rain and fog. Valleys such as Glen Park Canyon are subject to fingers of fog and coastal winds. Soils tend to be rocky on the hills. Clay-loam derived from a parent material of dune sand, sandstone and shale occurs in the lower elevations.

General Recommendations

The Central District's moderate climate allows for a wide choice of tree species. Trees should be used to highlight edges, neighborhoods, commercial nodes, and landmarks. Views should be preserved in the hill areas by using small or medium-sized trees with open canopies.

Acacia baileyana requires the protection from winds typically found in the Central District.

Commercial Recommendations

1. Market Street: Platanus acerifolia at 30 to 40 feet o.c.
2. Mission Street: Pittosporum undulatum at 30 feet o.c.
3. Castro Street: Magnolia grandiflora (infill) and Tristania conferta (where plantings will not conflict with under ground utilities).
4. Twenty-Fourth Street: Maytenus boaria (infill) or Trachycarpus fortunei at 25 feet o.c.

DOWNTOWN/CIVIC CENTER DISTRICT

Description and Urban Form

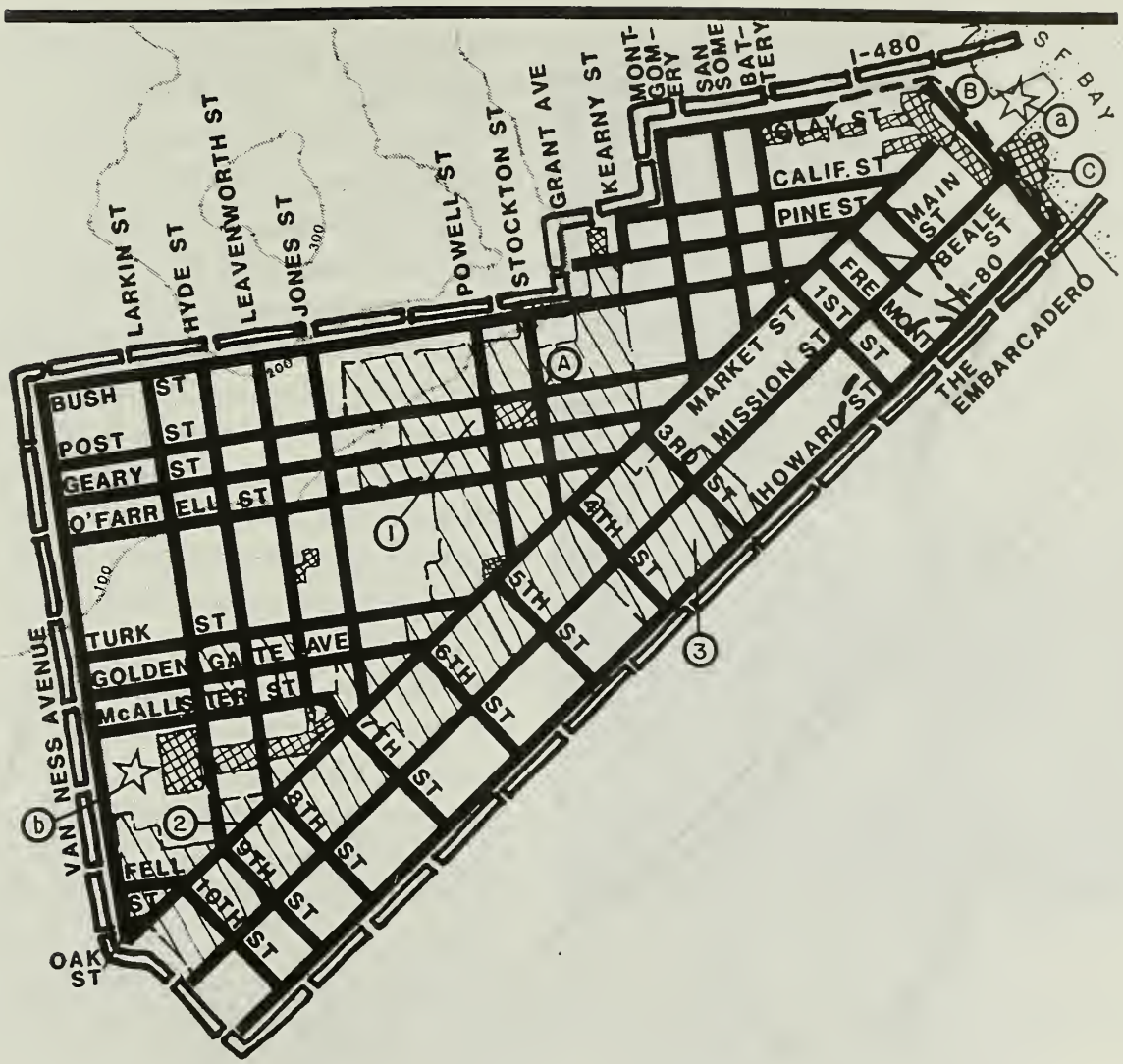
Location and Size. The Downtown/Civic Center District is located in the northeast corner of San Francisco between the Northeast and South of Market Districts. Covering an area of 825 acres or 1.3 miles, it is one of the smallest districts in the City.

Land Uses. The Downtown/Civic Center District is the City's hub of commercial and civic activity. In addition to the high-rise Financial District and Civic Center, it has numerous cultural areas and facilities, including the theater district, Opera House, Main Library, and Museum of Modern Art. Union Square (1) is the City's busiest shopping district. Adjacent to the great flow of commercial, civic, and cultural activity, Tenderloin residents live at the highest densities found in San Francisco.

City Hall. Plane trees, many of which have been pollarded, are the predominant species in the Civic Center.

Thoroughfares. Due to enormous numbers of people who live, work, shop or attend cultural events in the Downtown/Civic Center District, the majority of streets are major thoroughfares. The District is well-traversed with public transportation - BART, Muni and two Cable Car lines (Powell and California Streets).

Neighborhoods and Open Space. The aesthetic character of the sub-areas within the Downtown/Civic Center District is largely determined by land use. The Financial District and Embarcadero Center are characterized by high-rise office buildings



LEGEND

- DISTRICT BOUNDARY
- 1 COMMERCIAL AREA
- A OPEN SPACE
- a POINT OF INTEREST
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 10

Closely spaced trees with continuous canopies can help re-establish a human-scale ceiling in the Financial District.

with street-level retail support services. Union Square is noted for its fine retail stores and high-rise hotels enclosing a formally designed square from which it derived its name. Civic Center (b) has a fine assemblage of civic Beaux Arts architecture surrounding a central plaza. The Tenderloin is a high-density residential community composed primarily of elderly, office workers, and Southeast Asian immigrants living in multi-story apartments. Market Street, a wide commercial boulevard (2), bisects the district and features the Ferry Building (a) at its terminus.

The South of Market area between Market Street and Howard Street is undergoing a major transformation. High-rise office expansion crossing Market Street (3), the future completion of the Yerba Buena Center and the Moscone Convention Center expansion (see South of Market District description), and a likely increase in higher density housing will greatly alter the character of this part of the district.

Union Square.

Two major open space elements, Union Square (A) and Civic Center Plaza, are formally designed facilities attuned to tourists and office workers. Along the eastern edge of the district, Justin Herman Plaza (B), Maritime Plaza, Ferry Plaza East and the Promenade (C), provide recreational opportunities.

Natural Factors

The topography of the Downtown/Civic Center is generally flat, with gentle slopes occurring in the Tenderloin. Although the district is located in Climatic Zone 3, widespread tall buildings cast permanent shadows and create wind tunnels, particularly on east-west streets. Soils are comprised of Bay fill at the shoreline (Embarcadero Center) and sands.

General Recommendations

Trees in the Downtown/Civic Center area should generally be large-sized to effectively compose with the large-scale buildings characteristic of this district. Small trees, however, are often effective in the Financial District, particularly when planted to form a continuous overhead canopy. Trees, in the Tenderloin and Downtown must be tolerant of winds and shade. The Downtown also has extensive sub-sidewalk basements, which may necessitate planting in raised containers (see Trees for Streets, General Guidelines, page 30).

Many streets in the Tenderloin have been planted with upright trees such as Brisbane Box.

Commercial Recommendations

No additional tree plantings other than those given in the Thoroughfares and Downtown streets sections are recommended.

EXCELSIOR DISTRICT

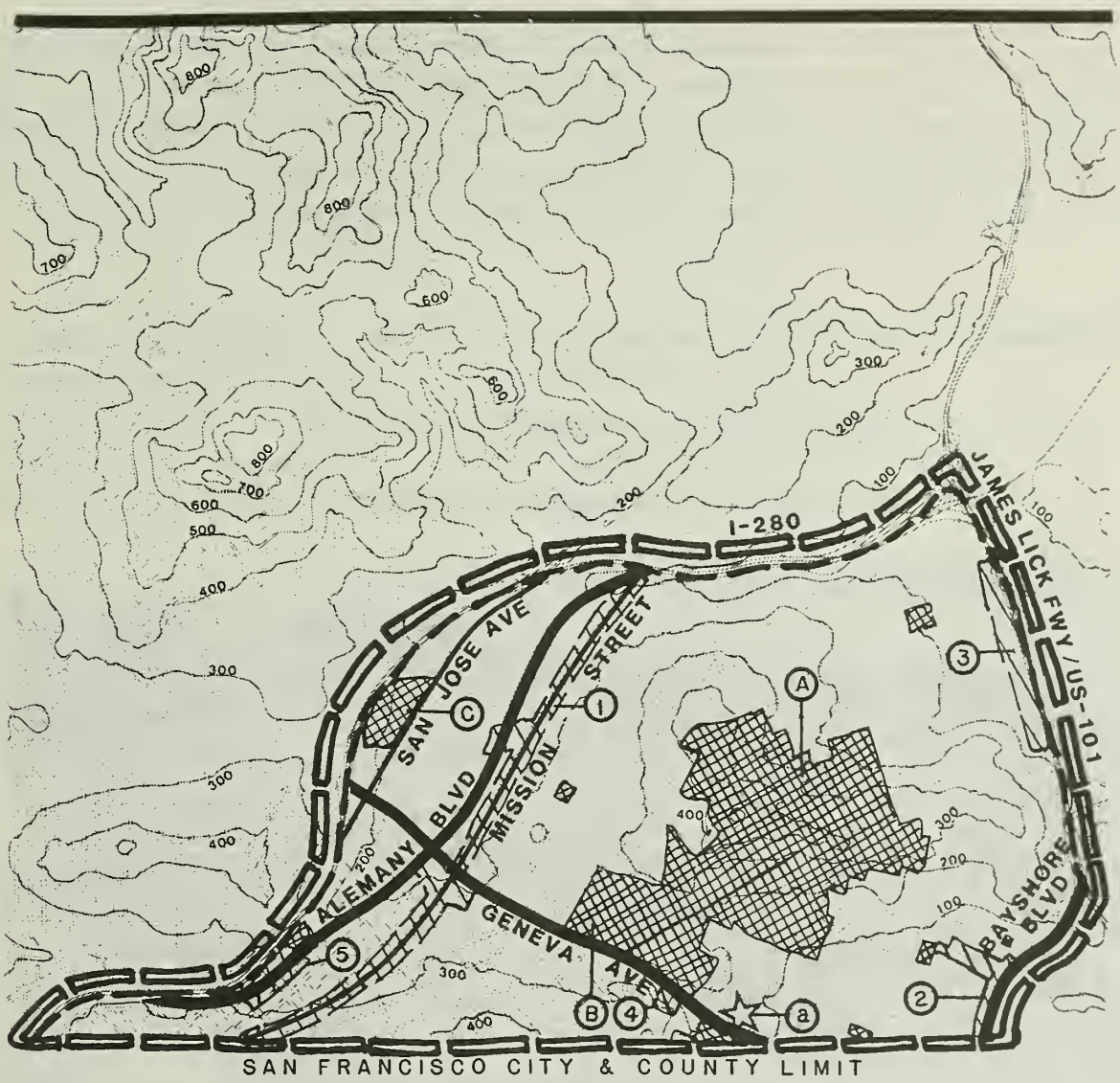
Description and Urban Form

Location and Size. Located along San Francisco's southern border, the Excelsior is one of the City's largest districts, extending over a land area of 2,880 acres or 4.5 square miles. It is bounded by Mount Davidson and the southern hills of the Ingleside District to the west, Bernal Heights to the north, and the South Bayshore District to the east. Major freeways mark the district boundaries - the James Lick Freeway (U.S.-101) establishes the eastern limit, and Interstate 280 the undulating northern and western edges.

Land Uses. The Excelsior is composed primarily of low-density residential neighborhoods built on the foothills of 318-acre McLaren Park (A), one of the few City parks left in its natural state. Medium to moderately-high residential densities occur along Mission Street, Bayshore Boulevard, Geneva Avenue, and San Bruno Avenue. Mission Street (1) serves as the primary commercial node for the western portion of the district, with sections of Geneva Avenue serving residents in the south. Commercial areas also occur at the intersection of Bayshore Boulevard and Leland Avenue (2) and along San Bruno Avenue (3).

Thoroughfares. Three of the Excelsior's four primary thoroughfares (Mission Street, San Jose Avenue and Alemany Boulevard) are parallel to I-280, forming a major transportation network that encloses the neighborhoods of Mission Terrace and Cayuga. Geneva Avenue is the only major thoroughfare with an east-west orientation.

Neighborhoods and Open Space. Most of Excelsior's single-family residential communities are located around the perimeter of John McLaren Park (A), which contains the City's largest undeveloped parkland and a golf course, and is adjacent to Crocker Amazon Playground (B). Two neighborhoods south of Geneva Avenue, South Hills and Crocker Amazon, are located on the northern foothill slopes of the San Bruno Mountains facing McLaren Park. Balboa Park (C), between Ocean and San Jose Avenues, is a large multi-purpose athletic facility, drawing



LEGEND

- DISTRICT BOUNDARY
- COMMERCIAL AREA (1)
- OPEN SPACE (A)
- POINT OF INTEREST (a)
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 11

users city wide. In addition, a number of small neighborhood parks and recreation centers are distributed throughout the district's neighborhoods. The Cow Palace Livestock Pavilion (a) straddles the Excelsior District's southern boundary, bringing activity to the surrounding neighborhoods and commercial district.

Natural Factors

The Excelsior is the only district in which all three climate zones occur. Neighborhoods located on west-facing slopes are exposed to strong coastal winds channeled eastward through the Visitation Valley and I-280 freeway corridor. Leeward neighborhoods on the east face of McLaren Park are more protected.

Streets running up the hillside toward McLaren Park have steeper slopes than these streets parallel to the contours.

The dominant topographical feature of the Excelsior is a gently sloping hill, the upper elevations of which comprise John McLaren Park. The variations in topography create excellent views as well as many microclimates.

Soils in the western portion of the Excelsior are generally sand and clay. McLaren Park and the eastern half of the district contain intermixed areas of sandy loam, loam, and clayey loam underlain by bedrock of the Franciscan Formations.

General Recommendations

Views in hillside residential areas should be preserved with small or open-canopied trees. Windbreaks should be developed on north-south oriented blocks. Views of the western transportation corridor should be screened with large wind-resistant trees.

Commercial Recommendations

1. Mission Street: Pittosporum undulatum at 30 to 40 feet o.c.
2. Bayshore Boulevard: Geijera parvifolia at 30 feet o.c.
3. San Bruno Avenue: Geijera parvifolia at 30 feet o.c.
4. Geneva Avenue: Magnolia grandiflora at 30 feet o.c.
5. Alemany Avenue: Tristania conferta at 30 to 40 feet o.c.

Southern view from Bernal Heights showing the transportation corridor defining the Excelsior's northeastern boundary.

INGLESIDE DISTRICT

Description and Urban Form

Location and Size. Centrally located along the southern edge of San Francisco, the Ingleside is a large district, extending over 2.6 acres or 4.1 square miles. Comprised of a large group of residential neighborhoods on the slopes of Mt. Davidson and a hill to its south, the Ingleside is bordered by the Central Hills to the east and north, Interstate-280 to the southeast, and the Lake Merced and Sunset Districts to the west.

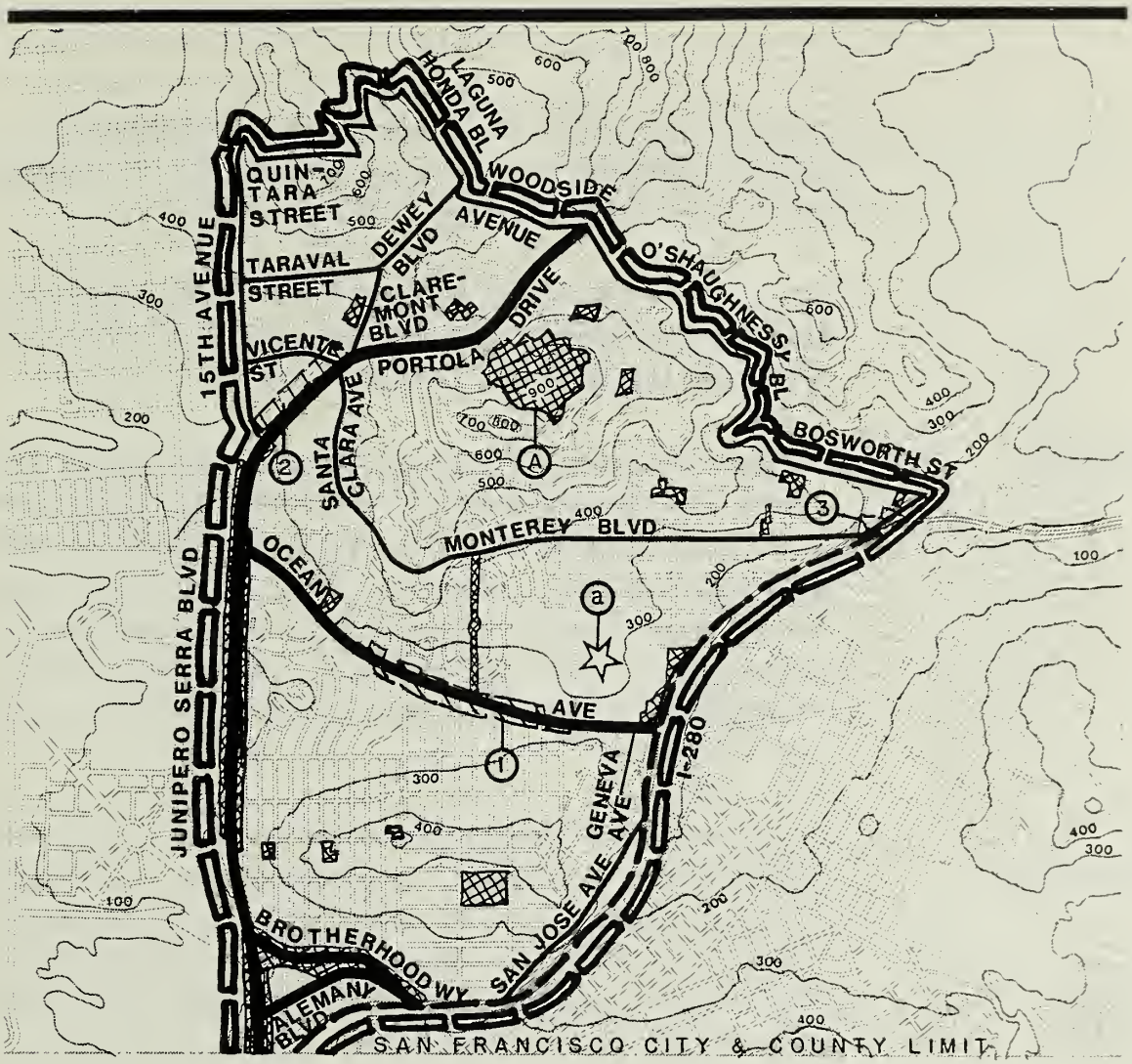
Land Uses. The Ingleside consists almost entirely of low-density single-family residential areas, with a small amount of moderately-low to medium-density housing along portions of its major and secondary thoroughfares.

Commercial nodes occur along sections of Ocean Avenue (1) West Portal (2), and Bosworth Street at I-280 (3), adjacent to Glen Park Transit Station. The district's primary institutional land use, City College of San Francisco (a), is located on the Ingleside's eastern edge.

Thoroughfares. The Ingleside is crossed by several major thoroughfares aligned through the valleys between the district's hills: Portola Boulevard, Ocean Avenue, and Brotherhood Way.

Neighborhoods and Open Space. Many Ingleside neighborhoods have names reflecting the district's two distinctive natural features: its hills and woodlands. They include Miraloma Park, Sherwood Forest, Sherwood Heights, St. Francis Wood, Mon-

Brotherhood Way's wide right-of-way offers unique landscaping opportunities for trees and shrubs native to the coast.



LEGEND

- DISTRICT BOUNDARY
- COMMERCIAL AREA (1)
- OPEN SPACE (A)
- POINT OF INTEREST (a)
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 12

terey Heights, Westwood Highlands, Balboa Terrace, Mount Davidson Manor, Westwood Park, Ingleside Terrace, Ingleside, Merced Heights, San Miguel, and Oceanview.

The Ingleside is low in public open space lands, particularly in the central part of the district. Mt. Davidson Park (A) is a major open space area located in the northern sector.

Natural Factors

Climatic conditions in the Ingleside are characterized by Zone 1 coastal winds and fog. Westerly winds are channeled between the district's hillside areas toward the Excelsior District. Soils are generally loam in the lowland valleys and clayey-loam in the upper elevations. Sand occurs in portions of the district's northwest corner, and interspersed clay and loam is found in the neighborhood areas of Forest Hill, Miraloma Park, and Sherwood Heights.

General Recommendations

The Ingleside District should be enhanced by an urban forestry program which emphasizes its neighborhoods, major thoroughfares, district edges, and commercial nodes. Species selection should reflect the district's coastal climatic conditions. Views should be preserved in hillside residential areas with small or medium-sized, open-canopied trees.

Commercial Recommendations

1. Ocean Avenue: Tristania conferta at 30-40 feet o.c.

2. West Portal: Pyrus kawakamii at 20-25 feet o.c. with Platanus acerifolia at corner bump-outs.

3. Bosworth Street: Pyrus kawakamii at 20-25 feet o.c.

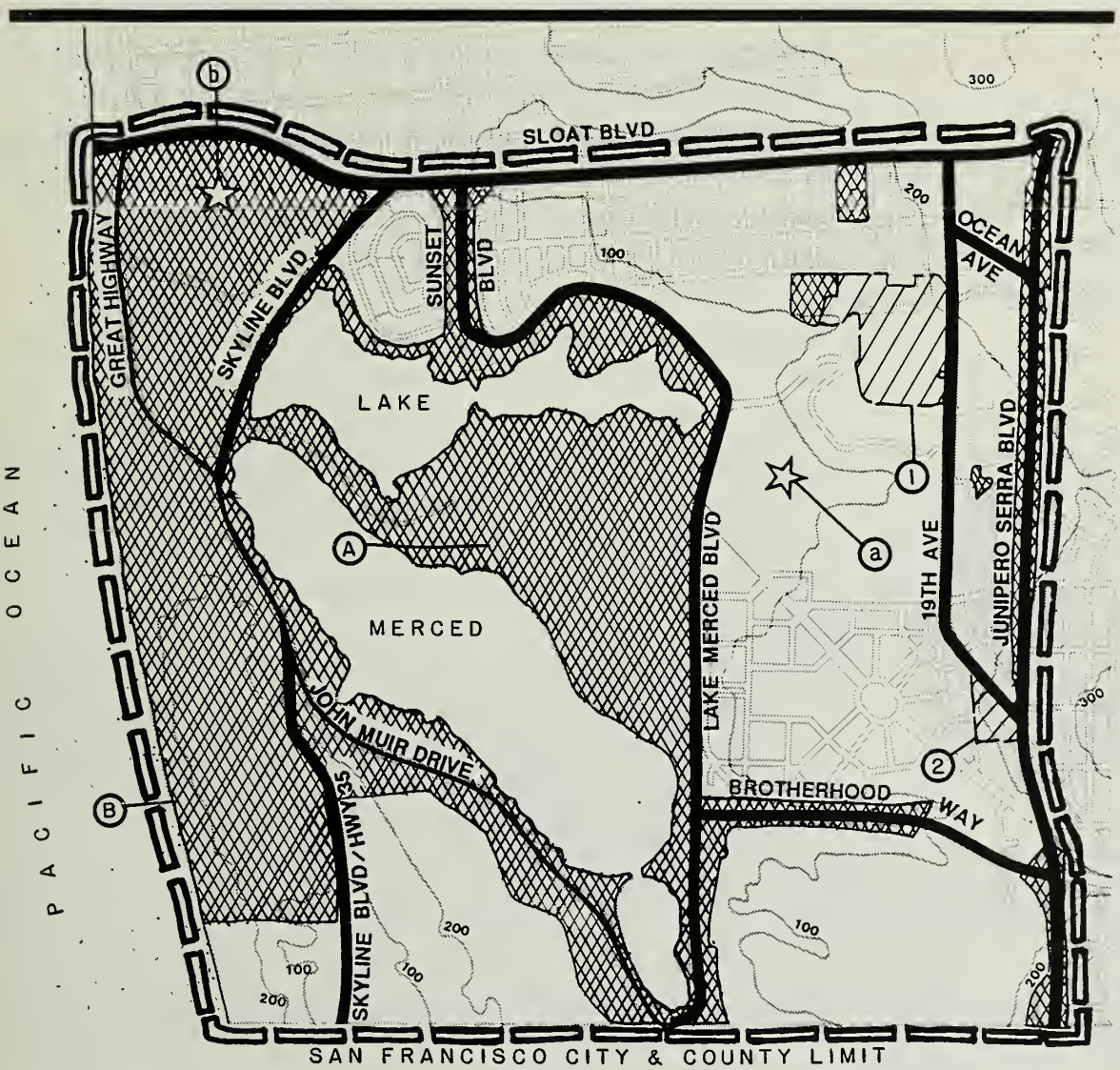
LAKE MERCED DISTRICT

Description and Urban Form

Location and Size. The Lake Merced District is located in the southwest corner of the City. Virtually square in geographic form, it is bounded by the Pacific Ocean on the west, the San Mateo County line on the south, and two major thoroughfares (Junipero Serra Boulevard and Sloat Boulevard) on the east and north. It is 2,400 acres or 3.7 square miles in size.

Land Uses. Development in the Lake Merced District has occurred in large parcels. Residential densities are low along the district's north, south and east perimeters, and medium to high in the Stonestown, Park Merced and John Muir communities. Stonestown Shopping Center (1) is the major commercial area. Most of the district's western half is held as open space administered by the City, federal government, or private groups. San Francisco State University (a) is located in the district's northeast sector.

Lake Merced. The lands surrounding this fresh water reservoir are extensively planted with conifers.



LEGEND

- DISTRICT BOUNDARY
- (1) COMMERCIAL AREA
- (A) OPEN SPACE
- (a) POINT OF INTEREST
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 13

Thoroughfares. The Lake Merced District is bounded by several major thoroughfares: Junipero Serra Boulevard, Sloat Boulevard, and the Great Highway. Several additional major and secondary thoroughfares encircle Lake Merced, providing scenic connector routes to adjoining districts and San Mateo County.

Neighborhoods and Open Space. The Lake Merced District has numerous low-density suburban single-family developments constructed after World War II: Lakeside, Merced Manor, Country Club Acres, and Lakeshore. Park Merced, John Muir, Lake Merced Hill, and Stonestown are medium to high-density developments of townhouses or apartments. The district's extensive open space system is composed of numerous large-scale elements: Lake Merced (a fresh water reservoir), three golf courses, Harding Park (A), the San Francisco Zoo (b), and coastal lands administered by the Golden Gate National Recreation Area (B). Sunset Boulevard and Brotherhood Way connect with Lake Merced Boulevard to create a scenic drive linking the Sunset and Ingleside Districts.

Natural Factors

The Lake Merced District experiences a classically coastal climate characterized by western winds and summer fog. The topography gently slopes up from the Pacific Ocean to Junipero Serra Boulevard. Soils are characteristically sand and clay except for a shoreline band of dune sand.

General Recommendations

The Lake Merced District would benefit from a street tree planting program which established a dramatic aesthetic character consonant with the scale of its wide boulevards. Residential communities should be planted with trees well-adapted to the coastal climate. Higher-density residential areas should be planted with medium to large trees blending with the natural surroundings.

Commercial Recommendations

Both Stonestown (1) and the small commercial area at Nineteenth and Junipero Serra (2) occur along Nineteenth Avenue, a major north-south thoroughfare passing through the district. The recommended trees for Nineteenth Avenue at this location are Pinus radiata and Eucalyptus spp. No additional trees are recommended for either commercial area.

Trees planted in the single-family neighborhoods along the northern district edge (County Club Acres, Lakeshore, Merced Manor and Lakeside) should have an orderly, well-kept appearance in keeping with the residential architecture.

MARINA DISTRICT

Description and Urban Form

Location and Size. The Marina District, a moderately-sized district of 1.75 square miles, is located in the north-central sector of the City. Sloping down toward San Francisco Bay, it offers magnificent views of the Golden Gate Bridge and Marin Headlands. Pacific Heights forms its southern boundary, and the wooded hillsides of the Presidio frame its western edge. Two major thoroughfares with commercial frontage, California Street and Van Ness Avenue, define the Marina's southern and eastern boarders.

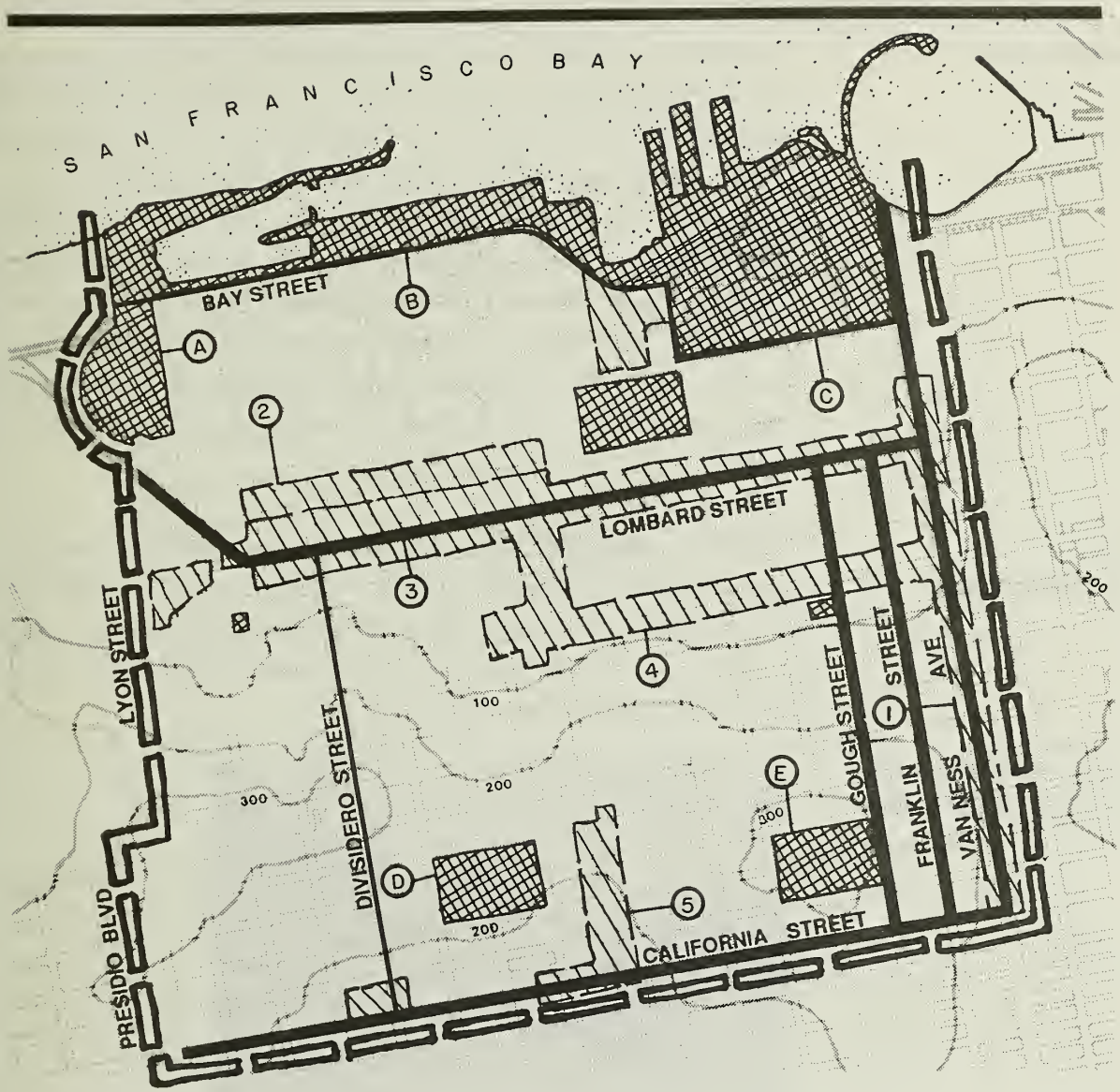
Land Use. The Marina is primarily a residential area of generally low to moderately-low density. Moderately-high residential densities occur along all of Lombard Street and portions of Union Street and Fillmore Street. The Marina has many important commercial nodes, including Van Ness Avenue (1), Chestnut (2), Lombard (3), Union (4), and Fillmore (5) Streets.

Thoroughfares. Gough Street, Franklin Street and Van Ness Avenue join with Lombard Street to link the Golden Gate Bridge with the Central Skyway (U.S. 101), located just south of the Western Addition District. Bay Street and Marina Boulevard provide a scenic drive along Fort Mason and the San Francisco Marina.

Neighborhoods and Open Space. The Marina District is composed of three neighborhoods. The Marina, built on the site of the 1915 Panama Pacific International Exposition, primarily consists of stucco Mediterranean-style housing. Cow Hollow is perhaps best known for Union Street (4), a busy shopping and night-life area. Pacific Heights contains many outstanding examples of residential architecture.

Following the Loma Prieta earthquake, many street trees were planted in the Marina neighborhood after street and sidewalk reconstruction.

The Marina District contains or is bordered by excellent open space elements: the last vestige of the 1915 Exposition, the Palace of Fine Arts (A); the Presidio; the Golden Gate National Recreation Area; the Marina Green (B) and Marina Yacht Harbor; Fort Mason (C); and two hilltop parks, Alta Plaza (D) and Lafayette Square (E).



LEGEND

- DISTRICT BOUNDARY
- COMMERCIAL AREA (1)
- OPEN SPACE (A)
- POINT OF INTEREST (a)
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

N

2000 ft.

SITE MAP

Figure 14

Natural Factors

Located in climatic Zone 2, the Marina's climate is moderated by the wooded hills of the Presidio. Western winds bear coastal fog and salt air through the district and are channeled down the east-west streets. The topography rises from the flatlands adjacent to the Bay, up the steep slopes south of Cow Hollow, to the hilltops of Pacific Heights. The southernmost portion of the Marina slopes down toward California Street and the Western Addition beyond. Soils consist of alluvial deposits along the waterfront and sandy-clayey soils throughout most of the district. Franciscan rock formations occur in portions of the hilltop areas.

General Recommendations

Small to medium trees of regular form should be selected to preserve and enhance the visual character of the Marina's fine architecture. A dramatic streetscape character should be developed for Lombard Street and Van Ness Avenue, reflecting their function as a gateway into the City.

Pacific Heights is extensively planted with small and medium-size street trees.

Commercial Recommendations

1. Van Ness Avenue: Platanus acerifolia at 40 feet o.c. with median planting of Eucalyptus spp.

2. Chestnut Street: Maytenus boaria (infill)

3. Lombard Street: Washingtonia robusta at 40 feet o.c. with Tristania conferta where plantings will not conflict with signing.

4. Union Street: Pyrus kawakamii at 20 to 25 feet o.c. and Prunus cerasifera at 20 feet o.c. (infill).

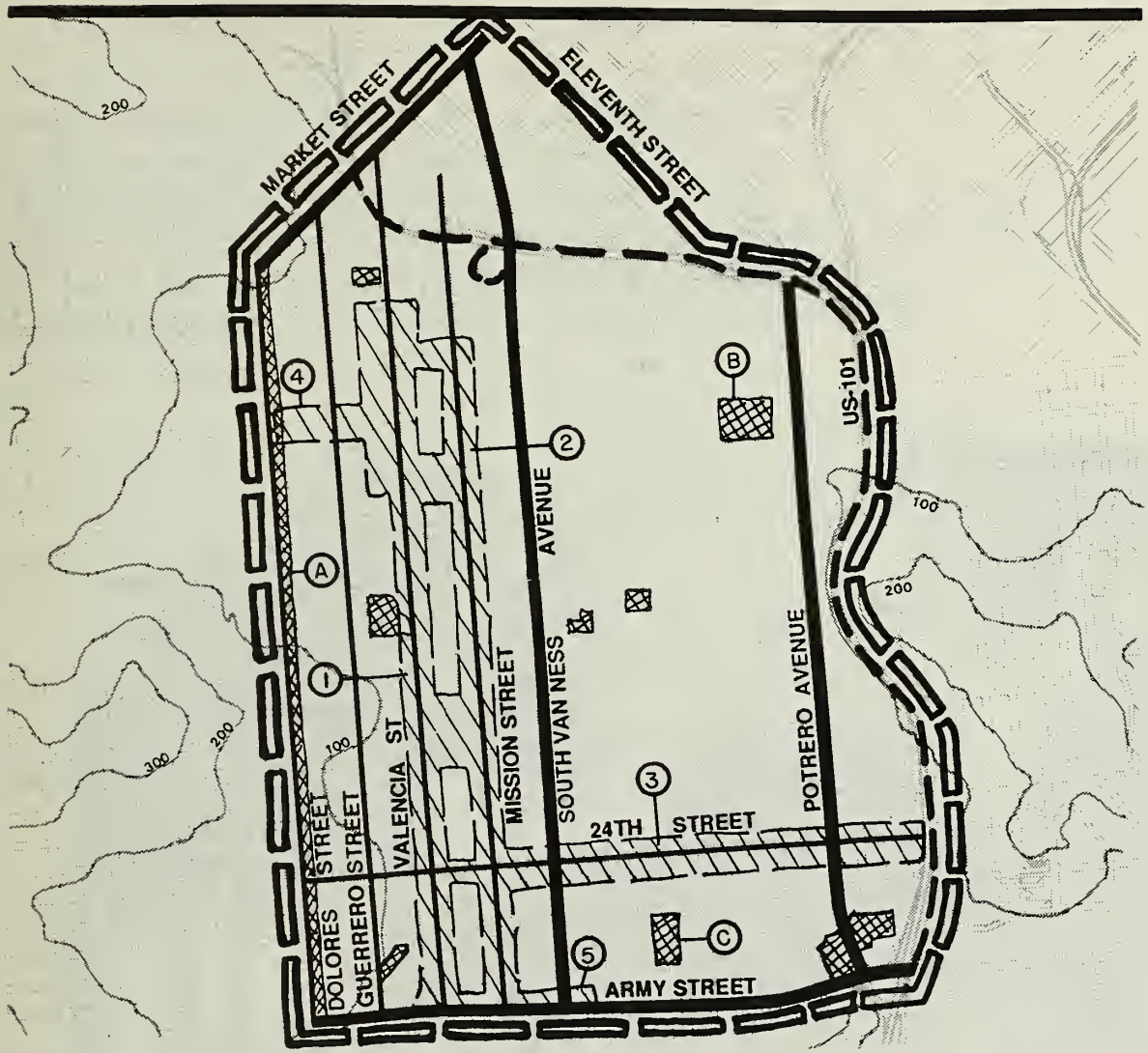
MISSION DISTRICT

Description and Urban Form

Location and Size. A relatively flat, two-square-mile gridiron bounded by hills to the west, east and south, the Mission District is well-protected from the coastal fog and winds that typify San Francisco's climate. It is defined by Dolores Street to the west, Army Street to the south, U.S. 101 to the east, and Market Street and 11th Street to the north.

Land Uses. The Mission contains a variety of land uses. Residential areas generally have moderately-low to medium densities with moderately-high densities along the districts western edge. Light industrial uses occur in the northeast quadrant. Valencia (1) and Mission (2) Streets are two closely parallel neighborhood commercial streets. Twenty-fourth Street (3) is the only major commercial street with an east-west orientation.

Mexican Fan Palms and Victorian Box trees are planted on Mission St. between 15th Street and 24th Street.



LEGEND

- DISTRICT BOUNDARY
- (1) COMMERCIAL AREA
- (A) OPEN SPACE
- (a) POINT OF INTEREST
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 15

Thoroughfares. The western half of the Mission has an extremely dynamic character, with four north-south streets (Dolores, Mission, Guerrero and South Van Ness) serving as a transportation corridor linking south San Francisco with the Downtown and South of Market Districts. Two Bay Area Rapid Transit stations at 16th and 24th Streets on Mission further reinforce the Mission's role in the City's transportation network.

Dolores Street.

Neighborhoods and Open Space. Unlike other districts, the Mission does not break down into smaller neighborhood communities. Relatively flat, self-contained by adjacent hills and laid out in a consistent grid pattern, it has a singular geographic identity.

The Mission District's open-space system is limited. Nearly half of its area is not within an acceptable walking distance of an open-space facility. The park-like quality of Dolores Street (A) and the adjacent Mission Dolores Park (see Central District description) provide a lush, green eastern edge. The Mission District also has two small parks, Franklin Square (B), Garfield Square (C), and scattered playground facilities.

Natural Factors

Protected from coastal winds and fog by the hills of the Buena Vista District to the west, the Mission District typically experiences less fog and milder temperatures than other districts. It is often referred to as the City's "Banana Belt".

The Mission's bowl-like topography is surrounded by prominent hills: Potrero Hill to the east, Bernal Heights to the south and Mount Sutro, Buena Vista Hill and Twin Peaks to the west. These hills form an excellent scenic backdrop for district residents.

Soils consist of dune sands in the south-central area and sandy-clayey loam along the east and west slopes.

General Recommendations

The Mission District's benign climate provides an excellent opportunity for diverse tree plantings. Medium to large trees combined with accent trees should be planted within the District's commercial and transportation corridors. A gateway streetscape effect should be established where these streets cross district boundaries. Large trees should be planted in the Mission's light industrial area.

Commercial Recommendations

1. Valencia Street: Infill with Maytenus boaria at 20 to 25 feet o.c. or Tristania conferta 30 to 40 feet o.c.

2. Mission Street: Pittosporum undulatum alternating with Washingtonia robusta at 30 to 40 feet o.c.

3. Twenty-fourth Street: Tristania conferta (infill).

4. Sixteenth Street: Tristania laurina (infill).

NORTHEAST DISTRICT

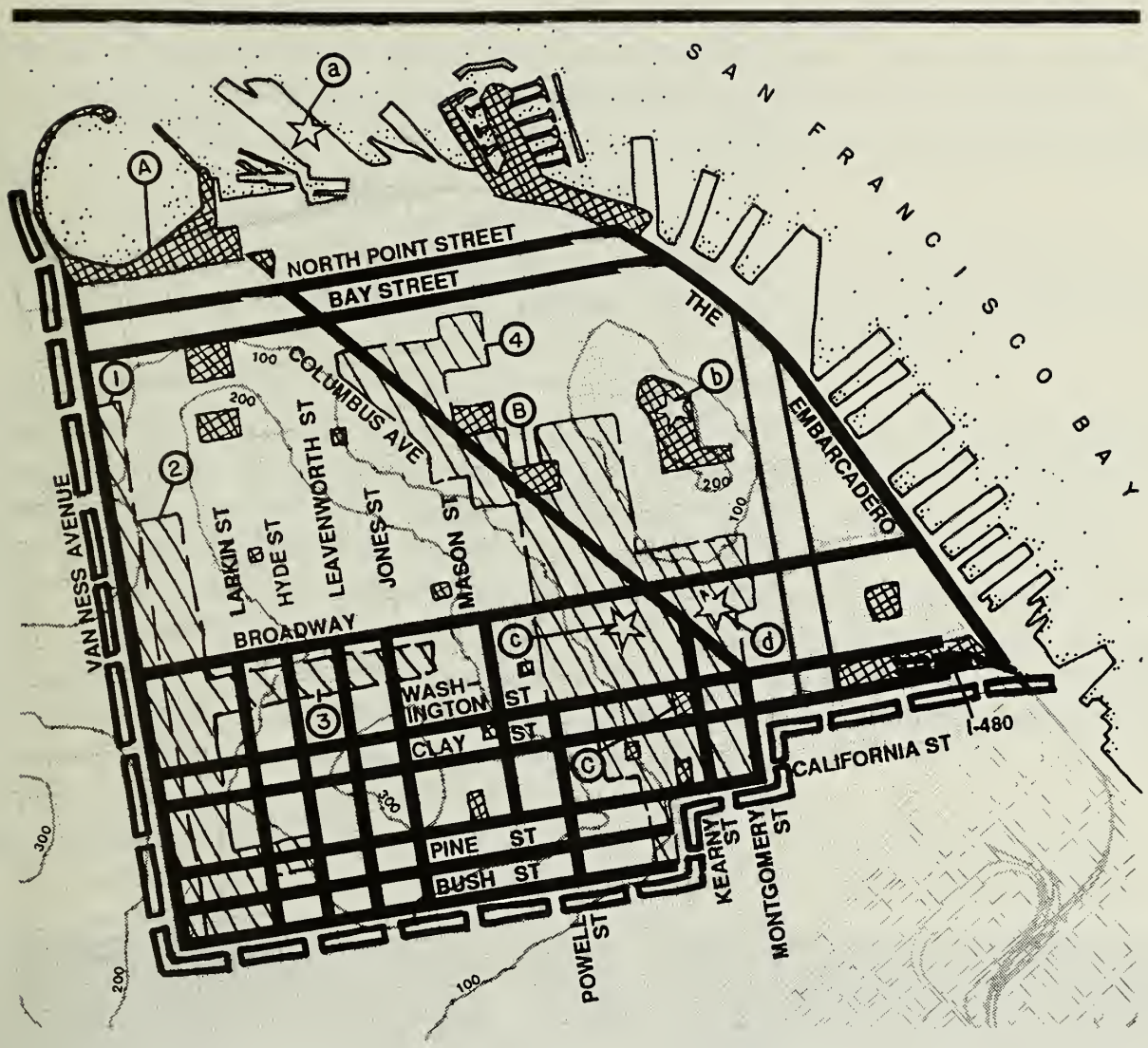
Description and Urban Form

Location and Size. A moderately-sized district, Northeast extends over 1170 acres or 1.8 square miles. It is bordered by the San Francisco Bay on the north and east, Bush Street on the south, and Van Ness Avenue on the west.

Land Uses. The Northeast District contains several colorful residential areas as well as a considerable amount of commercial and cultural activity attracting tourists and Bay Area residents. High-rise office buildings occur in the district's southeast sector. The Northeast District has many points of interest, including Fisherman's Wharf (a), Coit Tower (b), Aquatic Park, Chinatown (c), and the Jackson Square Historical District (d).

Thoroughfares. Major thoroughfares direct traffic to and from the downtown area (Pine, Bush and California Streets), toward the northeast waterfront and the Oakland-San Francisco Bay Bridge and freeway connections (Broadway, The Embarcadero,

Eastern view from Telegraph Hill toward the Embarcadero.



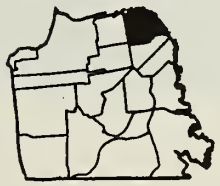
LEGEND

- DISTRICT BOUNDARY
- COMMERCIAL AREA (1)
- OPEN SPACE (A)
- POINT OF INTEREST (a)
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP



SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 16

Washington and Clay Streets); and to the Golden Gate Bridge and Northwestern areas of the City (North Point and Bay Streets). Van Ness Avenue defines the district's western edge. In addition, Columbus Avenue cuts diagonally through North Beach between Telegraph Hill to the east and Russian Hill and Nob Hill to the west. All three cable car lines run through the Northeast (Powell-Hyde, Powell-Mason and California).

Neighborhoods and Open Space. The Northeast District contains many of the most popular residential neighborhoods and commercial districts in San Francisco. Chinatown is a richly-textured and densely populated residential and commercial neighborhood. Many of its buildings date back to the era of reconstruction following the 1906 earthquake and fire. Nob Hill, with its city-wide views, is the site of several of the City's major hotels, as well as many attractive residential buildings. Jackson Square has the largest collection of 19th-century architecture remaining in the downtown area. The Golden Gateway is a high-density residential redevelopment area which replaced wholesale produce markets in the 1960s. Residents of Russian Hill, a neighborhood consisting of apartments and single-family homes, enjoy excellent views. The sheltered location of Polk Gulch, centered on Polk Street behind Russian and Nob

Gateway to Chinatown on Grant Street.

Hills, provides a moderate climate for this popular residential and commercial area (1). North Beach (4) is a traditional, closely-knit community with well-preserved commercial and residential architecture.

Van Ness Avenue (1), Polk Street (2) and Powell Street (3) are notable commercial streets complimenting the vibrant commercial activity in Chinatown and North Beach.

The open space system in the Northeast District consists of urban squares and parks heavily frequented by residents, workers and tourists. Aquatic Park (A), Pioneer Park/Coit Tower (b) and Fisherman's Wharf (a) are favorite tourist attractions. Washington Square Park (B) provides a central plaza for North Beach, and Portsmouth Square (C) is a highly-used open space in Chinatown. Michelangelo Park (Greenwich Street between Leavenworth and Jones) contains many semi-dwarf fruit trees and dwarf conifers.

Natural Factors

Most of the Northeast District lies within Climate Zone 3, known for generally clear, sunny skies. Winds are deflected and

Washington Square. Italian Stone Pines along the park's eastern edge recall North Beach's Italian heritage.

channeled by Russian, Nob and Telegraph Hills, creating wind-protected areas on the leeward slopes. Winds commonly occur along the entire waterfront.

Bay fill soils are prevalent in the low-lying waterfront areas. Clayey-loam soils are found throughout most of the district, with rock outcroppings occurring on the hill peaks.

General Recommendations

The Northeast's extensive network of major thoroughfares should be planted with large trees. Views from the residential hill areas should be preserved with wind-tolerant small trees or open-canopied medium-sized trees. Fisherman's Wharf and Jackson Square should be planted with a designated tree(s) to underscore their area limits.

Commercial Recommendations

Pyrus kawakamii at 20 to 25 feet o.c. or Pittosporum undulatum at 30 to 40 feet o.c.

In windy areas: Metrosideros excelsus at 30 to 40 feet o.c.

POTRERO DISTRICT

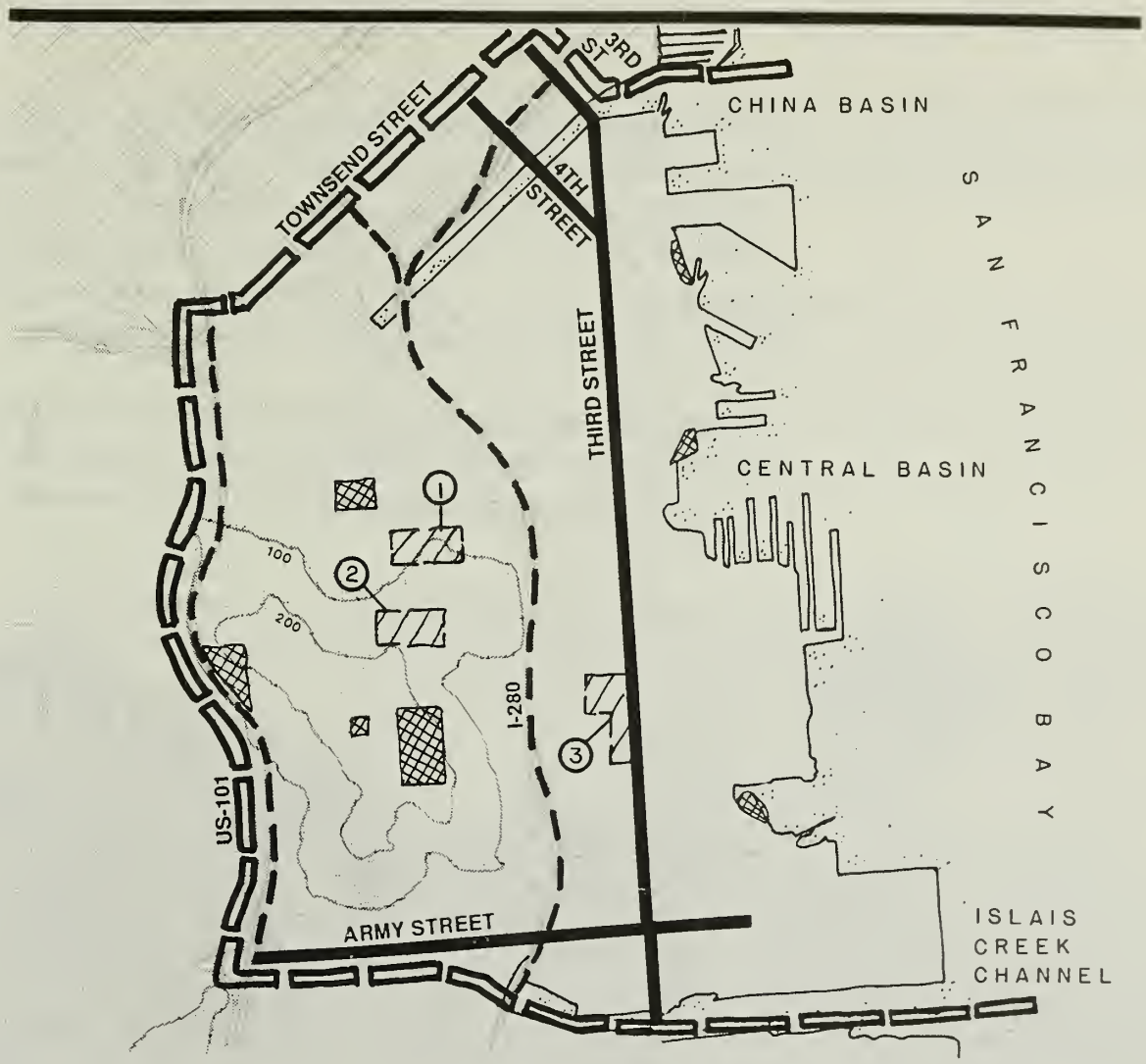
Description and Urban Form

Location and Size. The Potrero District is located between the South Bayshore and South of Market Districts along San Francisco Bay. A moderately-sized district of 1860 acres or 2.9 square miles, it is bounded by U.S.-101 to the west, Army Street to the south, and Townsend Street and Third Street to the north.

Land Uses. The Potrero's land uses are primarily residential and industrial. Industrial uses dominate the central waterfront area, which covers approximately half of the district. Most of the central waterfront is used for large-scale commodity distribution functions such as wholesaling, storage trucking, and railroad yards. Waterfront maritime uses include cargo handling and storage and ship-repair operations.

Apparel manufacturing and interior-design services have been a healthy component of the Potrero District's economy for some time. The district is also experiencing an influx of professional firms attracted by presently favorable rental rates.

Maritime and industrial uses characterize the Potrero District's waterfront area.



LEGEND

- DISTRICT BOUNDARY
- COMMERCIAL AREA (1)
- OPEN SPACE (A)
- POINT OF INTEREST (a)
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 17

Residential development occurs primarily in the Potrero Hill area. Densities are moderately-low to medium, with moderately-high densities in housing development near the district's southern border. Neighborhood commercial nodes serving Potrero residents are located on the northern slopes of Potrero Hill (1, 2) and along a short section of Third Street (3).

Thoroughfares. Most of the Potrero's major thoroughfares define its edges. Interstate-280, an elevated freeway bisecting the district, defines the western limit of waterfront and industrial activities.

Although I-280 divides the Potrero District, the tall retaining wall on the east side of Potrero Hill is beautifully integrated with the landscaping.

Neighborhood and Open Space. The aesthetic character of the Potrero is largely influenced by the its industrial and maritime activities. These uses cover over half its land area and are viewed by many Potrero Hill residents.

The Mission Bay area is the proposed site for a large "city within a city" development including residential, commercial and recreational areas. Showplace Square is an old warehouse district which has been rehabilitated into a major wholesale furnishings center. The Potrero Hill residential community is noted for its Victorian architecture, benign climate, and excellent views.

Victorian-style Potrero residence. Palms compliment this architectural style.

Public open-space in the Potrero is within walking distance of most district residents. The waterfront currently has limited public access.

Natural Factors

The Potrero District is situated in climate Zone 3. The City's central hills to the west, as well as Potrero Hill itself, lessen the impact of winds and fog.

Much of the waterfront is fill material obtained from leveling some of the City's hills. The district's parent material is ultrabasic intrusive rock found along the shear zone and in serpentine outcroppings. All of the Potrero's soil types are low in nutrients and drain poorly.

General Recommendations

The industrial and maritime areas of the Potrero should be planted with large trees tolerant of the bay-fill soils prevalent in the central waterfront area. Tree plantings on Potrero Hill should preserve residential views. Potrero Hill's western slope should receive windbreak plantings with open-canopied, medium-sized trees. Freeways and major thoroughfares should be flanked with large trees to soften views of the district's industrial areas.

Commercial Recommendations

1. Third Street: Tristania laurina at 20 feet o.c. and Washingtonia robusta at 40 feet o.c. in the median strip.

2. Twentieth Street: Arecastrum reomanzoffianum at 30 feet o.c.

3. Eighteenth Street: Alternate groupings (3 minimum/group) of Pyrus kawakamii and Callistemon viminalis at 20 to 25 feet o.c.

Palms are recommended for this commercial area on Twentieth Street.

RICHMOND DISTRICT

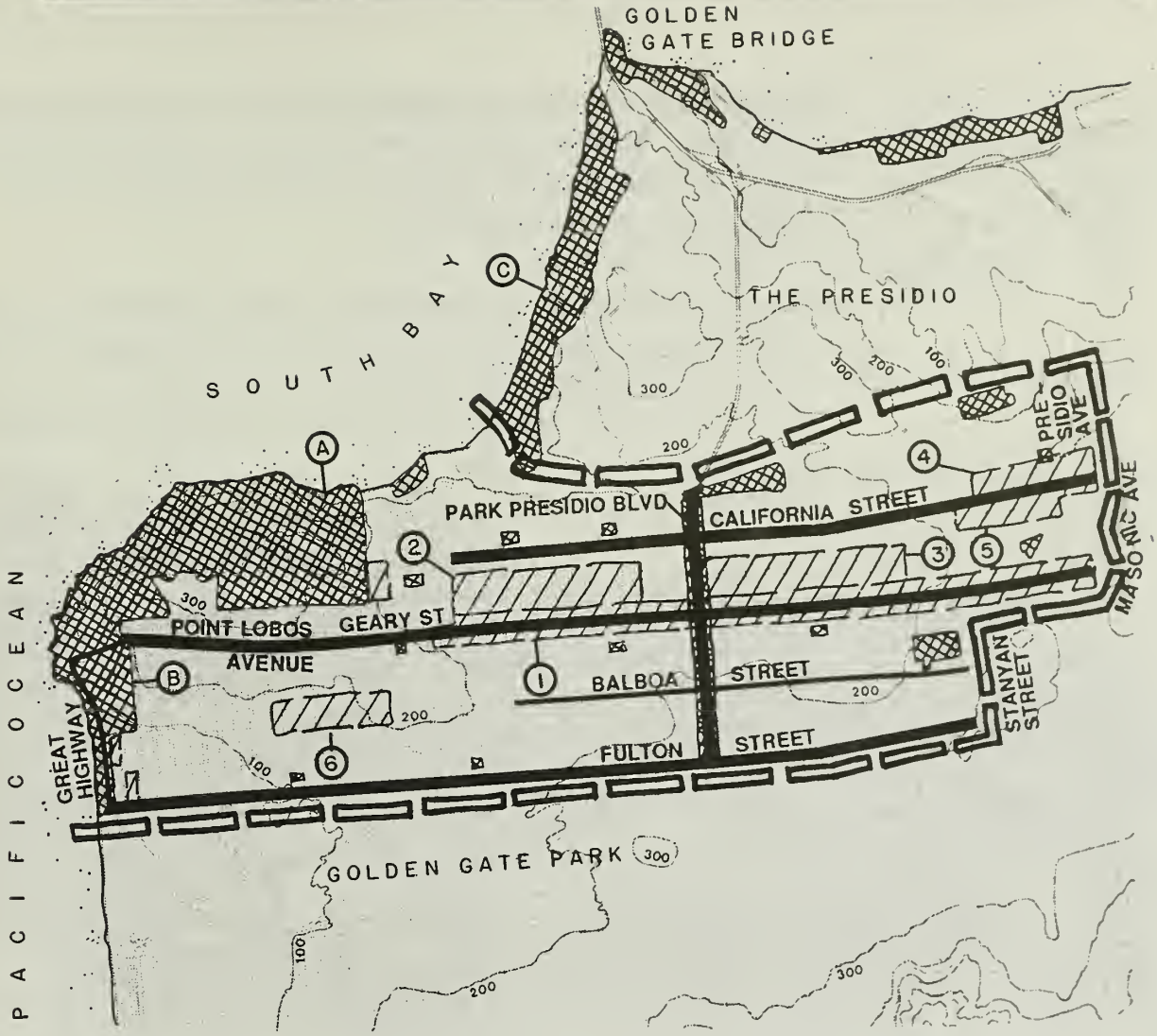
Description and Urban Form

Location and Size. The Richmond District is located in the northwestern corner of the City. Covering a land area of 2100 acres or 3.2 square miles, it is bounded by some of San Francisco's most outstanding open space elements and natural features: the Pacific Ocean to the west, the Presidio to the north, and Golden Gate Park to the south.

Seal Rocks west of the Richmond's coastal bluffs.

Land Uses. The Richmond is primarily composed of residential communities of low to medium densities. Moderately-high residential densities occur along portions of Geary Boulevard, California Street and Arguello Boulevard. Neighborhood commercial nodes are located along portions of four east-west oriented streets: Geary Boulevard, Clement Street, Balboa Street, California Street and Sacramento Street.

Thoroughfares. The Richmond's major and secondary thoroughfares generally parallel the District's long east-west dimension. Major cross traffic occurs only at Park Presidio Boulevard, part of a regional transportation network linking San Francisco with Marin County and the Peninsula.



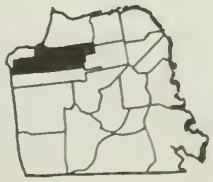
LEGEND

- DISTRICT BOUNDARY
- COMMERCIAL AREA (1)
- OPEN SPACE (A)
- POINT OF INTEREST (a)
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP



SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 18

Neighborhoods and Open Space. The Richmond is composed of numerous residential neighborhoods with excellent housing stock. Neighborhood size tends to be smaller in the hills along the district's eastern edge.

Residents in the Richmond enjoy easy access to the ocean, Lincoln Park (A), Sutro Park (B), Golden Gate Park, the Presidio, and the Golden Gate National Recreation Areas (C). In addition, a number of modestly-sized neighborhood parks are scattered throughout the district.

Sutro Park. Conifers help shelter areas in the park from coastal winds.

Natural Factors

The Richmond's cool Zone 1 coastal climate is characterized by northwesterly winds and fog. The street grid alignment creates two general microclimatic conditions: (1) north-south streets are somewhat wind-protected by 2-3 story residential buildings on their windward (western) side; (2) on east-west streets, buildings funnel winds as they travel eastward.

The district's overall topography is flat, with hills along its eastern edge.

The Richmond's north-south streets are some what more protected from westerly winds. Note effect of undergrounding utility wires

The Richmond District originally consisted of sand dunes with rugged bluffs fronting the ocean. Although the dunes have been stabilized, soils are still very sandy and require amendments to improve water and nutrient retention.

General Recommendations

Streetscapes adjacent to major open space areas may extend the aesthetic character of the park setting; however, species selection should be sensitive to residential views toward these open space areas. When appropriate, restrictions on tree size and

form may be suspended in neighborhoods with underground utilities. Trees adapted to the Richmond's coastal conditions should be planted in open space areas to lessen the force of the westerly winds.

Commercial Recommendations

1. Geary Boulevard: Metrosideros excelsus at 30 feet o.c.

2. Clement Street: Alternating groupings (minimum of 3/group) of Rhamnus alaternus and Callistemon viminalis, 20 to 25 feet o.c.

3. Clement Street: Rhamnus alaternus at 20 to 25 feet o.c. to accent existing Ulmus.

4. California Street: Eucalyptus ficifolia interplanted with existing Platanus acerifolia.

5. Sacramento Street: Saponara quillaja at 30 to 40 feet o.c.

6. Balboa Street: Eucalyptus ficifolia at 30 to 40 feet o.c.

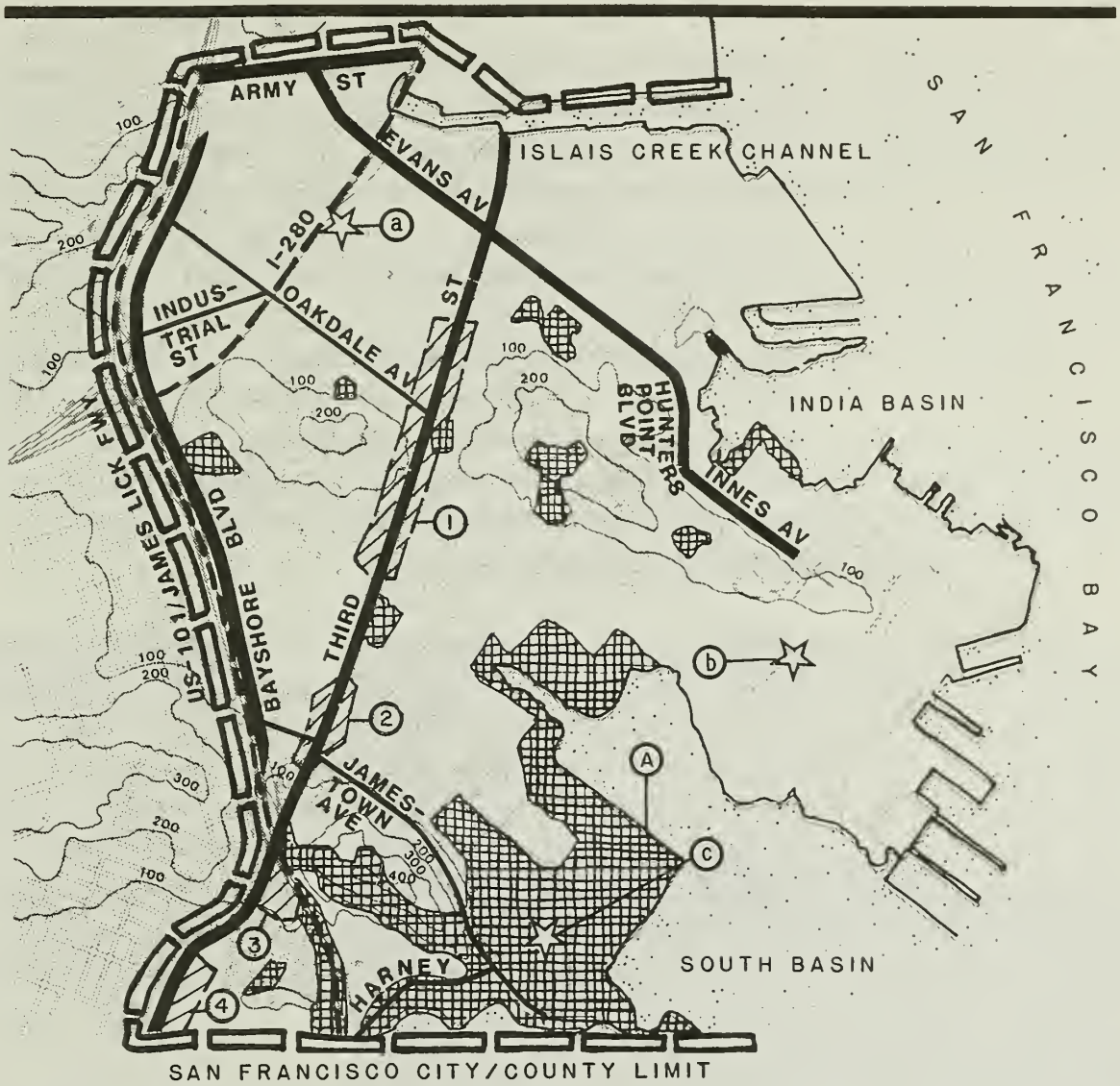
SOUTH BAYSHORE DISTRICT

Description and Urban Form

Location and Size. The South Bayshore District, located in the southeastern corner of the City, extends over approximately 3,200 acres or five square miles. Bayshore Boulevard and U.S. 101/James Lick Freeway, a major regional transportation corridor, form its western border. San Francisco Bay defines the eastern edge, and Army Street and the Islais Creek Channel form the northern boundary.

The district is generally flat, with streets laid out on a grid oriented southeast to northwest. Two low hills in the center of the district have curvilinear streets responding to the change in land form.

Roadside hedgerow of Italian Stone Pines. The bulk of large housing developments can be softened with trees.



LEGEND

- DISTRICT BOUNDARY
- COMMERCIAL AREA (1)
- OPEN SPACE (A)
- POINT OF INTEREST (a)
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 19

Land Uses. The South Bayshore contains a wide variety of land uses, including low to medium-density single-family residential, commercial, light industrial and manufacturing. Additional land uses and points of interest include the San Francisco Produce District (a), Hunters Point Naval Shipyard (b) and Candlestick Park (c), home to the City's professional sports franchises.

Thoroughfares. Three major thoroughfares are located in the South Bayshore. Army Street and Bayshore Boulevard define the north and west borders respectively. Third Street bisects the district from north to south; portions of it function as commercial nodes (2, 3, 4). A fourth commercial area occurs on Thornton Avenue (1).

Neighborhoods and Open Space. South Bayshore is composed of seven neighborhoods. Silver Terrace, Bayview and Bret Harte are characterized by neatly-arranged white stucco row houses and old Victorians. These low, small-scale residential buildings, when coupled with the wide treeless streets result in an open, seemingly barren landscape. The Hunters Point neighborhood has several large housing projects with minimal landscaping. Light industry, manufacturing, and commercial areas are located in Apparel City, Islais Creek, and Candlestick Cove. Char-

Light-industry in the South Bayshore can be screened with fencing and tree plantings.

acterized by large bulky buildings, wide streets and bus and truck traffic, these areas have a coarse "grain" favoring automobiles over pedestrians. Sidewalks in some industrial areas are often used for parking, commercial loading or rail lines.

A significant district feature is Hunters Point Naval Shipyard. The U.S. Defense Department currently plans to close military operations, thus promoting a conversion to civilian use.

The core of the South Bayshore has a number of public open space areas, especially east of Third Street. Another important open space element is Candlestick Point State Recreation Area (A), providing access to the shoreline of San Francisco Bay.

The shoreline at Candlestick Point State Recreation Area is landscaped with Monterey Pine and Cypress trees.

Natural Factors

The South Bayshore experiences frequent, strong easterly winds and coastal weather conditions. Two centrally located hills provide panoramic views over surrounding neighborhoods toward San Francisco Bay and beyond.

Soils in the district's eastern half consist primarily of bayfill or rock. Western soils are composed of sandy loam underlain by bedrock of the Franciscan formation.

General Recommendations

The visual quality of the South Bayshore District could be improved with a major tree planting program. Particular concerns include: mitigating the effect of high traffic volumes along the major transportation routes; improving the streetscape character along the retail portions of Third Street; screening the parking lot at Candlestick Park; and emphasizing native coastal plantings in open space areas along the Bay.

Views should be preserved in hillside residential areas with small or open-canopied, medium-sized trees. Medium to large trees planted on east-west oriented blocks would provide an effective windbreak as well as softly frame the often wide streets. In industrial and manufacturing areas, the planting of large, coarse-textured trees would reflect and complement the scale of the buildings.

Candlestick Park.

Commercial Recommendations

1, 3, and 4. Third Street: Eucalyptus nicholii at 30 to 40 feet o.c.

2. Bayshore Boulevard: Eucalyptus nicholii at 30 to 40 feet o.c.

SOUTH OF MARKET DISTRICT

Description and Urban Form

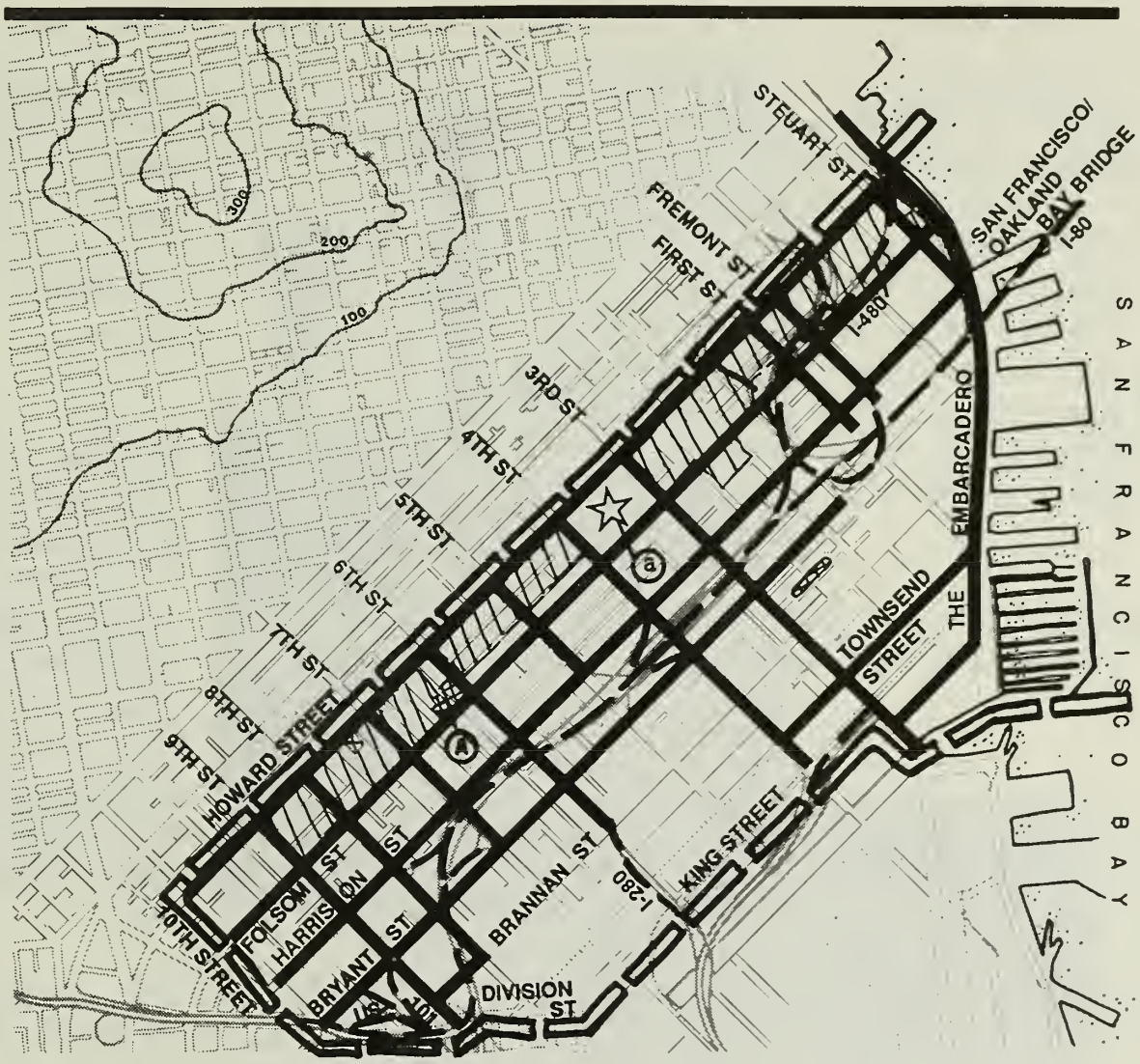
Location and Size. The South of Market District, located in the northeast sector of the City, is bounded by the Downtown/ Civic Center, Mission and Potrero Districts. It is one of the City's smallest districts, covering an area of 785 acres or 1.2 square miles.

Land Uses. The South of Market District contains a variety of land uses, including high-rise commercial offices, light industry, convention and hotel facilities, high-density residential apartments and hotels, and bus and rail transit terminals. Moscone Convention Center (a) is a focus for much of the district's contruction.

Moscone Convention Center.

Thoroughfares. Because of the District's strategic position with respect to the Downtown/Civic Center and the Bay Bridge, most of the district's streets serve as major thoroughfares. Many streets serve as feeders for Interstates-80 (San Francisco/ Oakland Bay Bridge) and 280.

Neighborhoods and Open Space. The South of Market district contains several neighborhoods or sub-areas. Rincon Hill, one of the wealthiest residential areas in the City before the 1906 earth-



LEGEND

- DISTRICT BOUNDARY
- COMMERCIAL AREA (1)
- OPEN SPACE (A)
- POINT OF INTEREST (a)
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

N

2000 ft.

SITE MAP

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

Figure 20

Sixth and Folsom Park is primarily planted with Palms.

quake, presently consists of a mixture of uses including offices, warehouses and medium-density residential.

In addition to many new high-density residential developments, the South of Market area has recently experienced an increase in the number of artist studios and galleries, as well as nightclubs clubs and restaurants.

The South of Market has limited public open-space elements. The recent completion of Sixth and Folsom Park (A) will improve recreational opportunities for district residents.

Natural Factors

Climatic conditions in the South of Market District are strongly influenced by building height. Streets bordering high-rise offices east of Second Street tend to be cooler and experience higher winds than the lower-density areas west of Second Street.

As is common throughout the City, north-south streets are more protected from westerly winds.

The predominantly flat landscape is overlain with a combination of old dune sand and alluvium including fill and bay mud. Alluvium is primarily located in the southern part of the district.

General Recommendations

The South of Market District should generally be planted with medium to large trees to most effectively frame the edges of the District's many broad thoroughfares. Trees in the high-rise office areas must be both shade and wind-tolerant. Sub-sidewalk basements are common in parts of the district, and may preclude at-grade street tree plantings (see Trees for Streets, general guidelines, page 30). Commercial establishments such as restaurants and galleries may be highlighted by small accent trees, particularly when they occur amidst light-industrial uses. Large, tall trees should be planted along elevated freeways to soften their appearance.

Commercial Recommendations

No additional trees are recommended for commercial areas other than those given in the Major Thoroughfares and Downtown Streets sections.

Raised planters are often the only way to have street trees in the South of Market's commercial areas.

SUNSET DISTRICT

Description and Urban Form

Location and Size. The Sunset District is centrally located along the western edge of the City. One of the City's largest districts, it extends over 3,350 acres or 5.2 square miles. The Sunset is defined by Golden Gate Park to the north, the central hills to the east, Lake Merced to the south and the Pacific Ocean to the west.

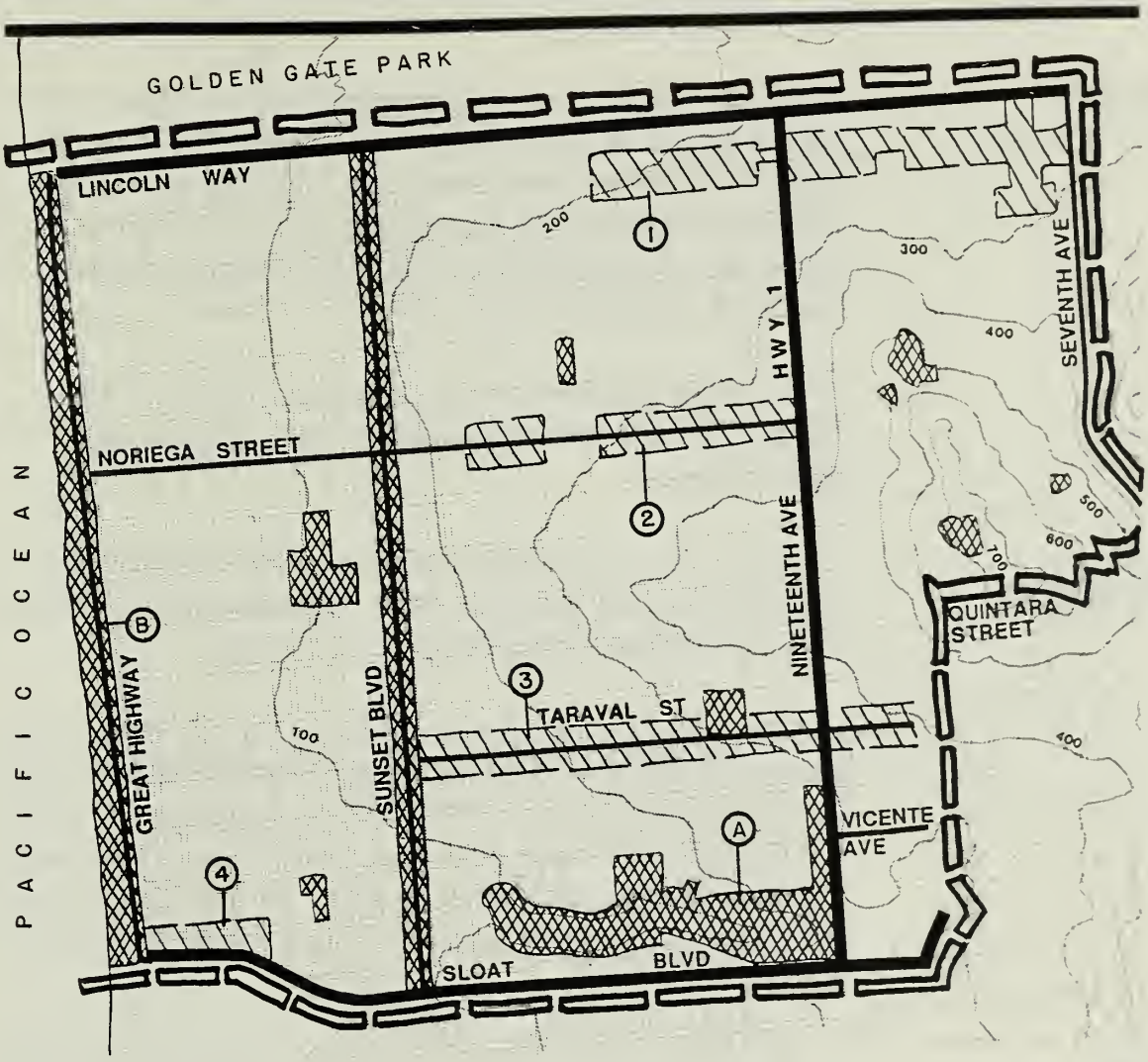
Land Uses. The Sunset is primarily a low-density residential district with moderately-low to medium densities occurring along portions of the district's major thoroughfares and/or commercial nodes. Neighborhood-oriented commercial areas are all located on east-west streets: Noriega (1), Taraval (2) and Irving (3).

Thoroughfares. In addition to the network of major and secondary thoroughfares defining the district edges, the Sunset is segmented by two major north-south thoroughfares: Sunset Boulevard and 29th Avenue. Taraval and Noriega, two east-west secondary thoroughfares, complete an evenly distributed lattice-work of primary vehicular routes.

Stern Grove is characterized by dense plantings of Blue Gums.

Neighborhoods and Open Space. The Sunset and Parkside communities consist of similarly designed single-family row houses for which the Sunset District is known. The Sunset's characteristic north-south grid does not occur in the eastern hill communities of Sunset Heights and Golden Gate Heights.

Residents of the Sunset District rely heavily on neighboring large-scale open space features (Golden Gate Park, Lake Merced, Pacific Ocean) for recreational opportunities. Within the District, Pine Lane, Stern Grove and Larsen Park (A) attract residents and tourists. A large portion of the district's center is not within easy walking distance of any public open space facility.



LEGEND

- DISTRICT BOUNDARY
- 1 COMMERCIAL AREA
- A OPEN SPACE
- a POINT OF INTEREST
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

N

2000 ft.

SITE MAP

Figure 21

Natural Factors

Facing the Pacific Ocean, the Sunset District receives the full force of coastal winds and fog. Harsh winds funnel up the east-west streets toward the eastern hills. The latter provide spectacular views of surrounding neighborhoods and parks, and protect the zone saddled east of Golden Heights and Grand View Park and west of Mt. Sutro.

Sandy soil occurs throughout the district, except for interspersed clay and loam in the eastern hills and loam in the southeastern corner.

General Recommendations

The Sunset District's monotonous visual quality resulting from repetitive housing types and street patterns could be enhanced by tree plantings emphasizing species variety.

Plantings along Sunset Boulevard should also be diversified, particularly in the understory, to enrich the Boulevard's visual character. Winds may be reduced with windbreaks of medium to large trees, especially on east-west streets. Neighborhoods adjacent to park lands should consider "borrowing" the latter's visual quality by planting either similar or contrasting tree species.

Commercial Recommendations

1. Irving Street: Melaleuca quinquenervia (dominant) at 30 feet o.c. Eriobotrya deflexa (accent) at 25 to 30 feet o.c.

2. Noriega Street: Metrosideros excelsus at 30 feet o.c.

3. Taraval Street: Melaleuca quinquenervia or Tristania conferta at 25 to 30 feet o.c. 25 to 30 feet o.c.

4. Sloat Boulevard: Metrosideros excelsus at 30 feet o.c.

WESTERN ADDITION DISTRICT

Description and Urban Form

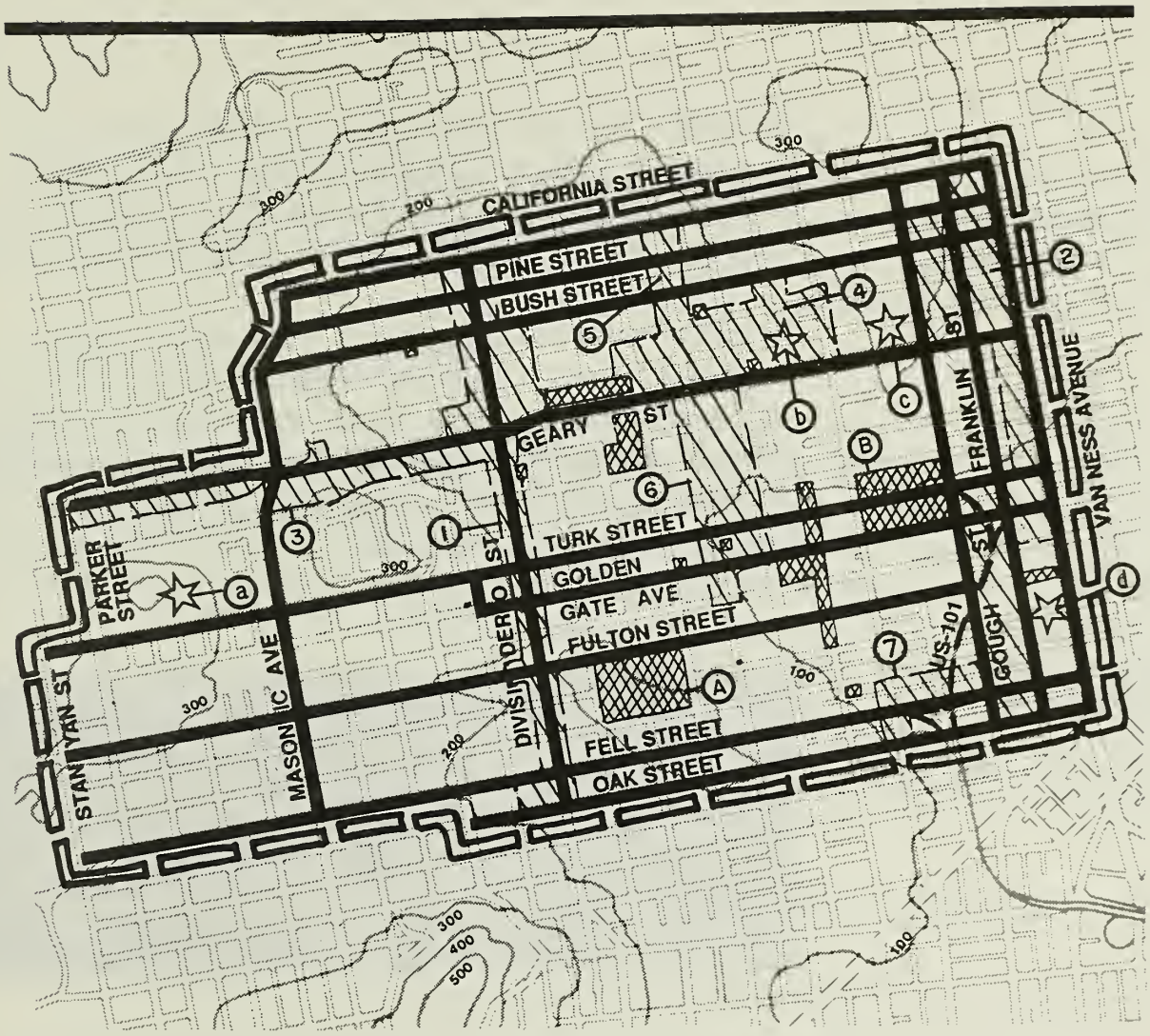
Location and Size. Located in the north-central sector of the City, the Western Addition was so named when it extended the City's western boundary (then Larkin Street) in the 1860's. A moderately-sized district of 1,130 acres or 1.8 square miles, the Western Addition is a gently-sloping valley enclosed by the Pacific Heights hills to the north and Buena Vista hills to the south. The terrain generally falls from higher elevations at the Richmond District border toward Van Ness Avenue at the Western Addition's eastern edge.

Land Uses. The Western Addition contains a wide variety of land uses, many resulting from large-scale redevelopment projects built during the past thirty years, including moderately-low density residential neighborhoods; medium to high-density

Large trees such as the Plane trees shown here are appropriate alongside the Western Addition's many large-scale institutional and residential buildings.

housing developments, several major hospitals and numerous commercial centers and cultural facilities. Points of interest include the University of San Francisco campus (a), the Japanese Cultural Center (b), St. Mary's Cathedral (c), and the Civic Center complex west of Van Ness Avenue (d).

Thoroughfares. The Western Addition has many major and secondary thoroughfares crossing through its boundaries. Nine major east-west thoroughfares linking the Downtown/ Civic Center area with the northwest corner of the City pass



LEGEND

- DISTRICT BOUNDARY
- COMMERCIAL AREA (1)
- OPEN SPACE (A)
- POINT OF INTEREST (a)
- MAJOR THOROUGHFARE
- SECONDARY THOROUGHFARE
- FREEWAY

SEE TEXT FOR DESCRIPTIONS OF OPEN SPACES, COMMERCIAL AREAS, AND POINTS OF INTEREST

N

2000 ft.

SITE MAP

Figure 22

through it. Five north-south streets, including the major regional transportation corridor comprised of Gough Street, Franklin Street and Van Ness Avenue along the district's eastern edge, also carry high volumes of traffic through the district.

Neighborhoods and Open Space. The Western Addition is composed of many residential neighborhoods. Anza Vista, University Terrace, Lone Mountain and Alamo Square are established residential neighborhoods noted for their quiet settings, scenic views and Victorian or Bauhaus architecture. The Beideman area is the repository of many Victorians relocated during redevelopment in other parts of the Western Addition. Hayes

Victorians adjacent to Alamo Square with the Downtown beyond.

Valley is a 160-acre tract which has retained its old character through a recent rehabilitation. Fillmore Center, Japantown and Cathedral Hill are large-scale redevelopment areas typified by large, multi-storied buildings and high residential densities.

The open-space system in the Western Addition generally consists of small parks and playgrounds set within the City grid. Notable open space elements are Alamo Square (A) and Jefferson Square (B). The Western Addition also benefits from its close proximity to Golden Gate Park and the Panhandle.

Natural Factors

The Western Addition lies in the transitional area (Climate Zone 2) between the coastal and Bay climatic zones. It typically experiences cool to moderately warm temperatures, light fog and clear sunny days. Northwesterly winds from the Richmond District cross through the district on their way toward the Civic Center.

Soils in the Western Addition are rich and well-drained. Sandy soils predominate in the east side of the district. A finger of sandy loam extends diagonally from the northwestern hills toward the low-lying center. Clayey loam is found in the western corner.

General Recommendations

A critical concern in the Western Addition is planting medium to large trees along the district's many major and secondary thoroughfares, both to improve the aesthetic character of these wide streets as well as provide better neighborhood definition. Medium to large trees should also be planted along all large-scale development within the neighborhoods. Specific neighborhood streets with notable residential architecture should receive consistent treatment: bold, textural trees should highlight the sculptural massing of contemporary buildings, while Victorian architecture should be planted with more finely-textured regularly-shaped species.

Commercial Recommendations

1. Divisadero Street: Gingko biloba at 40 feet o.c.

2. Van Ness Avenue: Platanus acerifolia at 40 feet o.c.

3. Geary Boulevard: See Major Thoroughfares section, p. 64

4. Hayes Valley: Ficus microcarpa or Acacia baileyana at 30 feet o.c. (infill)

5. Fillmore Street: Pyrus kawakamii at 30 feet o.c.

6. Fillmore Street: Pittosporum undulatum at 35 to 40 feet o.c.

7. Sutter Street: Platanus acerifolia (infill)

LANDMARK AND DISTINCTIVE TREES

Landmark Trees

The designation of landmark trees was incorporated in the 1986 Street Tree Ordinance. The Ordinance states: "With the advice of the Tree (Advisory) Board and following a public hearing, the Director (of Public Works) shall adopt criteria for the designation of landmark trees, which criteria shall include consideration of age, size, shape, species, location, historical association, visual quality, or other contribution to the City's character. Upon the recommendation of the Director, the Board of Supervisors may designate as a "landmark tree" any tree on property under the jurisdiction of the Department meeting the criteria adopted by the Director, or may rescind such designations." (Section 811a)

Subsequent to the enactment of the Ordinance, the Public Education Committee of the Tree Advisory Board developed a definition of and criteria for the Landmark Tree designation. A summary of their proposal is given below.

Definition: A tree or group of trees within the City's limits may be nominated as a Landmark Tree if they are within public right-of-way of any street, avenue, boulevard, lane, road, parkway, center island, or other public way including stairway walks and unimproved street rights- of-way.

A Landmark Tree shall meet one or more of the following criteria:

- Historical significance: association with a person, place, or event.
- Rare or unique horticultural specimen.
- Significant size (e.g., 16" @ 4'6" dbh) or age.
- Aesthetic value (symmetry, form, color, or other qualities).
- Visibility: prominence to public view; setting, environment.

The principle reason the Landmark tree designation is limited to street trees under the jurisdiction of the Department of Public Works is that the Department can exercise greater control over removal of any so designated tree. The Street Tree Ordinance further states: "Landmark trees shall be removed only upon a determination of the Director, following a public hearing and upon recommendation of the Tree Board, that the removal is necessary for the sake or reasonable use of property. The Director shall issue criteria governing such determinations. If the Director determines that removal of a landmark tree is necessary, he may impose such reasonable conditions on the permit for removal as he deems necessary to compensate the public for the loss of the tree, including but not limited to replacement of the tree and/or contribution to the Division's revolving fund for replacing and planting trees." (Sections b, c)

Before the Landmark tree section of the Street Tree Ordinance can be enforced, trees satisfying the established criteria must be selected. To date, no organization has received the authority to administer a Landmark Tree program. The Tree Advisory Board was created solely for the purpose of providing citizen input and professional expertise in an advisory capacity to the Director of Public Works, and thus has no power to implement or administer any urban forestry programs.

Distinctive Trees

The distinctive tree designation has been developed to give recognition to noteworthy trees not under the Department of Public Works jurisdiction. As discussed in 'Trees for Site Development,' some of the most beloved tree plantings in San Francisco are the groves, hedgerows, woodlands and specimen trees located outside public rights-of-way on public and private properties. The evaluative criteria for the distinctive tree designation are identical to those for landmark trees. If the tree or trees stand on private property, permission must be granted by the property owner before granting designation.

The objective of the Landmark and Distinctive Tree designations is twofold: to officially recognize the importance of trees as a part of our cultural heritage and urban ecology; and to pro-

mote a sensitivity toward how trees can be planted in the future to maximize their usefulness and aesthetic qualities. In addition to the enforcement of the Landmark Tree section of the Street Tree Ordinance, measures to achieve that objective could include: encouraging neighborhood and/or district associations to identify landmark and distinctive trees within their geographic areas; a City-wide map showing the location and listing the species of all such designated trees. Toward the realization of these or other measures, The Trees of San Francisco endorses the formation of a Landmark Tree Commission or Task Force to coordinate a joint effort by public and non-profit private agencies concerned with the City's urban forest.

5. PLAN IMPLEMENTATION

PLAN IMPLEMENTATION

The responsibility of caring for San Francisco's urban forest, presently numbering over half a million trees, rests with the public agencies, homeowners and commercial property owners holding lands on which these trees are planted. The Plan Implementation chapter addresses planning considerations, governental codes and review procedures, field and management practices, and administrative procedures relating to implementation of the policies set forth in The Trees of San Francisco.

Initiating a Tree Planting

Planning Considerations. San Francisco's publicly and privately-held lands have considerable potential for useful and beautiful tree plantings. Residential and commercial properties can be planted with a wide variety of species, depending upon the desired effect, landscape program and specific site characteristics (see 'Trees for Site Development', p. 144). Significant opportunities for trees, especially large-scale plantings such as forests and groves, are offered by public open space areas.

Street trees are a major component of the City's urban forest, greatly improving the aesthetic quality of residential neighborhoods, commercial areas and primary thoroughfares. Unfortunately, they are also the most susceptible to damage and the most costly to maintain.

Prior to planting, careful consideration must be given to the physical surroundings of the proposed planting site. Sidewalks, residential setbacks, park and open spaces, etc., are subject to the City's variable climatic conditions, as well as other environmental factors (see 'Environmental Factors', p. 17). These factors dictate which species are horticulturally suitable and thus narrow the list for further aesthetic/functional considerations. The "Tree Management Plan' chapter (p. 22) discusses these latter considerations in depth.

Assistance to the Public. The Department of Public Works, Division of Urban Forestry provides assistance to property owners in the selection of street trees. Another source of help is Friends of the Urban Forest, a private non-profit organization

offering a full range of services for neighborhoods planning to plant a minimum of thirty street trees. Further information regarding public and private agencies assisting urban forestry efforts can be found in the Appendix under the Urban Forestry Resource Guide.

Urban Forestry Codes

The City and County of San Francisco has few code requirements pertaining to trees. Its Planning Code does require the installation of street trees in any residential or neighborhood commercial district under the following conditions: (1) construction of a new building; (2) relocation of a building; or (3) the addition of floor area equal to 20 percent or more of an existing building. (See Appendix, Urban Forestry Codes.)

The Urban Forestry Ordinance was incorporated in the San Francisco Public Works Code in 1986. It promotes street tree planting in San Francisco, defines the powers and duties of the Department of Public Works' Urban Forestry Division, sets penalties for damaging or unlawfully removing street trees, and establishes the Tree Advisory Board to serve in an advisory capacity to the Director on urban forestry matters (see Appendix, Urban Forestry Codes).

Review and Permitting Procedures

In general, only street trees must undergo governmental review and approval in San Francisco. The Department of City Planning requires new development projects to indicate where street trees are to be located in public rights-of-way adjacent to their project. The developers then contact the Division of Urban Forestry for an on-site evaluation of the proposed planting locations. Careful attention is given to traffic safety and above-and-below-ground utilities (see ISCOTT standards, p. 32). After any necessary plan revisions, a planting permit is issued.

On a smaller scale, individual homeowners desiring or required to plant a street tree must contact Urban Forestry and apply for a permit. The site is inspected by a Division representative and an appropriate street tree is recommended.

Friends of the Urban Forest will assist in the permitting process

for tree planting projects undertaken with their coordination. In these instances, Urban Forestry retains the authority to locate the planting sites and issue the permits.

Trees planted in publicly-held open space are typically located according to plans and specifications of City urban foresters or landscape architects. Public input is often solicited during the planning process for these projects.

Private off-street plantings on small properties are generally installed by the property owner. Large-scale developments are usually installed under the direction of a consulting landscape architect. No permits from Urban Forestry are required in either case and the Department of City Planning holds no public or citizen review. However, the City Planning Commission may exercise its discretionary review power over any development for a variety of reasons, including those relating to trees.

Field Practices

Specification and Acquisition of Nursery Stock. Once the tree species have been selected for their horticultural and physical/aesthetic characteristics, high-quality nursery stock must be chosen to increase chances of survival. Tree selection should include the following standard guidelines:

- Each tree should have a well-developed and healthy root system, free of kinked or circling/girdled roots. A sample tree should be removed from its container and the root system inspected.

- Trunk diameter should be developed enough to support the height of the tree. The trunk should taper upward (widest portion at the bottom) and reverse tapers rejected.

- A branching pattern that is evenly distributed through the top two-thirds of the tree is desirable with narrow branch attachments avoided. At least half the branches should stem from points on the lower two-thirds of the trunk.

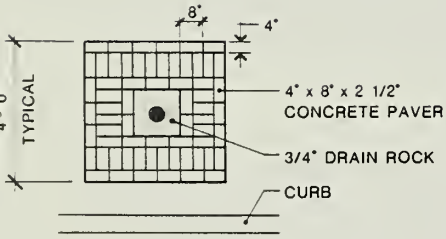
- Note the vigor of the tree and compare the growth ratio with vigorous trees of the same species. The tree should have typical coloration and be free of insects and diseases.

- Refer to the San Francisco City and County Specifications in the Appendix for further information.

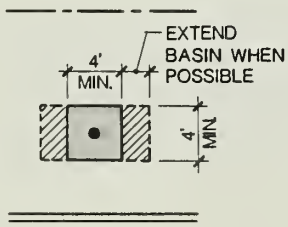
Tree stock should be inspected and tagged at the nursery and inspected again at the time of delivery. Trees damaged during delivery should be rejected.

If trees cannot be tagged at the nursery, the purchaser should require that each delivered specimen be identified with a tag giving the species (and cultivar, if appropriate). This procedure prevents nurseries from substituting related species or making errors in filling the order.

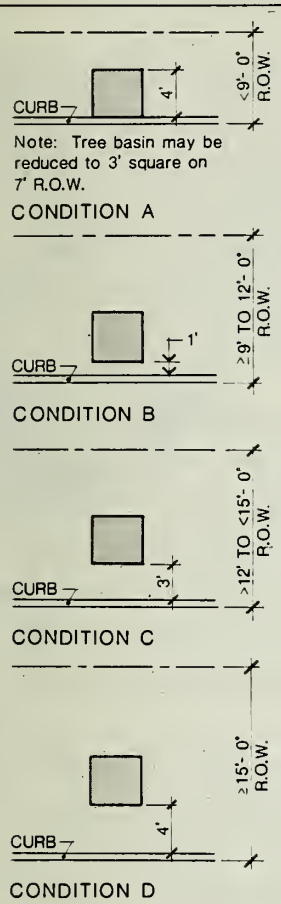
An alternative method of acquiring a reliable supply of tree stock is contract growing. Under this system, the client contracts with the grower for a stipulated number and species of tree to be grown under specified conditions. A price per tree is agreed upon and a deposit paid to the grower. The trees are inspected at the nursery by the client's representative and those complying with contract requirements accepted for delivery.



Tree Basin Details. Most of the sidewalk trees along San Francisco's streets are planted in basins created by sawcutting and removing existing paving or providing cut-outs in newly constructed sidewalks. Maximizing a tree basin's dimensions and properly detailing its construction significantly improve the health and vigor of the tree, as well as diminish the likelihood of future pavement damage.



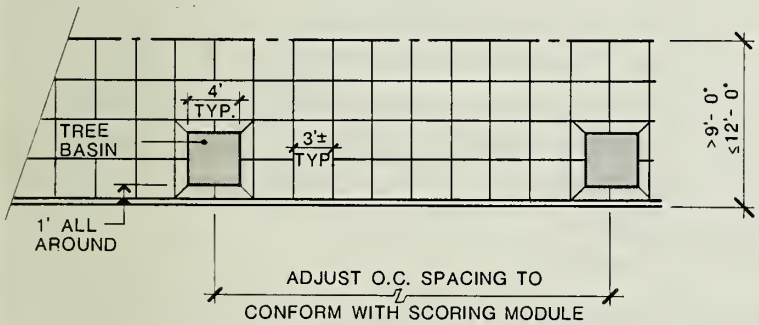
For these reasons, a 4' minimum basin width perpendicular to the curb is recommended; length should be no less that 4' (in limited circumstances where sidewalk width is 5'-7', a 2'- square tree basin is acceptable). Distance from face of curb will vary according to sidewalk width. Precast concrete or steel tree grates, bricks, cobble, quarry fines or concrete pavers set on

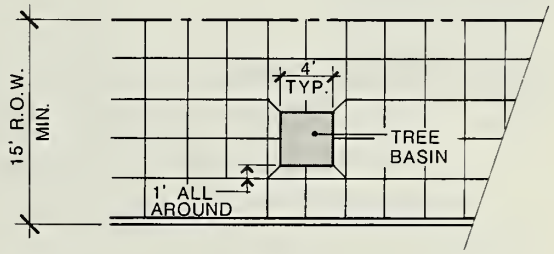


sand are excellent materials for retaining the basin area as a walking surface, an important concern in areas with high pedestrian use.

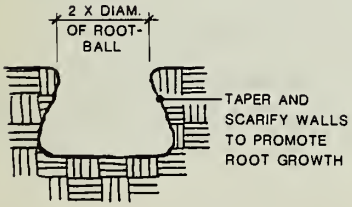
A minimum 2" thick paving material insures that the tree is planted below finished sidewalk grade. Modular materials, such as brick, are especially advantageous because they can be installed and then removed as the tree trunk increases in diameter. If a modular unit paver is to be used, an accurately scaled drawing indicating how the pavers shall be laid and precise tree basin dimensions is needed for sawcutting the existing sidewalk or installing new sidewalk paving.

A 4' minimum tree basin poses a design problem in new paving because it does not conform to the 3'- square scoring module typically used in sidewalks. One solution is to isolate the tree basin with a continuous band. On-center tree spacing may be adjusted in the field to conform to the 3' scoring module as it is constructed.



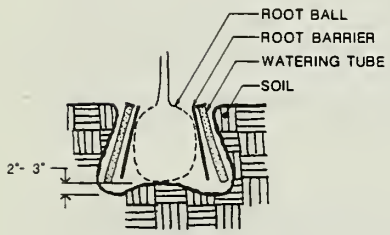


Planting Details. The techniques described in this section are most suitable for tree plantings occurring in sidewalks. Modification or elimination of the staking detail should be adopted for non-sidewalk trees. These trees would also benefit from the construction of a watering basin extending 18" in all directions away from the root ball.



- Preparing the planting hole. The planting hole should be excavated 2" less than the height of the root ball and twice the diameter. If amendments are added to the native soil, they should be high in organic matter, thoroughly mixed, and compose no more than 40% of the

overall soil volume. Care should be taken when planting trees after heavy rains or when the soil is saturated because soil texture can be damaged by working it. Filling the pit with water and observing the water percolation over the course of a few hours will determine whether the soil has adequate drainage. Areas with poor drainage should be planted with species tolerant of wet soil.

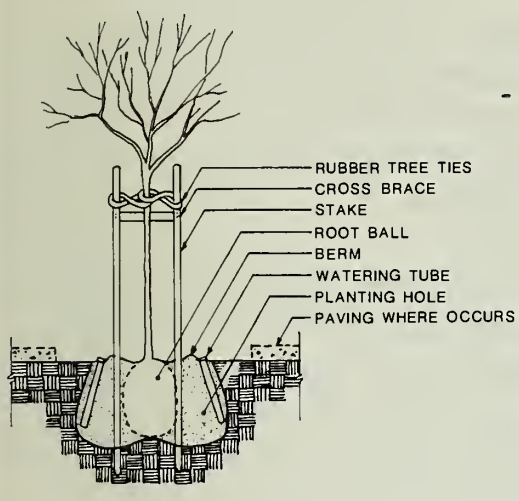


- Tree placement. The tree should be carefully removed from the container to avoid breaking apart the root ball. Remove matted or circling roots on the surface of the root ball and scarify to allow better contact with the backfill soil. Construct a small mound of soil (2"-3") in the bottom of the pit, tamping to avoid settling, and orient the tree with the strongest branches facing the prevailing winds.

USE WATERING BASIN FIRST 18 TO 24 MONTHS. WHEN TREE IS ESTABLISHED USE WATERING TUBES.

Placement of a 4"x24" watering tube at the outside of the root ball will ensure proper deep watering. The top of the tube should be at soil grade and filled with gravel. This allows for water to be directly delivered to the root zone without surface run-off while encouraging deep roots. Watering through the tube should only be done after the tree is established, usually within 18 to 24 months. Two tubes can be installed on opposite sides of the root ball to maximize deep watering. Trees planted on a grade should always have the water tube installed on the uphill side of the root ball.

- Root barriers. Barriers that force root growth downward are recommended whenever trees are planted in basins 28" square or less within a paved area. Barrier strips 48" in depth can be used to control root growth, although application is limited to rights-of-way with continuous planting strips. Another method of root control recently marketed is a vapor barrier strip, i.e. a synthetic textile material impregnated with an herbicide which inhibits tree roots within 2" of the strip from further growth. Manufacturers' claims that the barriers inhibit root growth for fifteen years have not had sufficient time to be adequately tested.



- Staking. Two 2" lodge pole pine stakes should be driven into the pit parallel to the street and adjacent to the root ball. A 1"x4" board nailed between the stakes adds to the stability of the stakes but must be positioned so as not to damage the tree by rubbing against it. Two rubber tree ties nailed to the stakes and wrapped in a figure eight pattern around the tree 6" above the point where the tree, if held by hand, will maintain an upright position complete the staking process. Positioning the straps is critical because the tree must move with the wind in order to develop proper trunk taper. If trunk diameter is sufficient to support the canopy unaided, the nursery stake should be removed.

Landscape trees that are located away from pedestrian traffic can be held upright with the use of an 8" deadman or anchor stake with guy wires (9 gauge). Generally, conifers planted in the landscape should not be staked.

- Irrigation. Eliminate air pockets by thoroughly flooding the partially backfilled tree pit. The soil should be firmly packed around the root ball to stabilize the newly planted tree. Fill basin to grade and construct a berm around the outside of the root ball to allow proper water penetration. The tree should be watered by surface application until established with the moisture content of the soil adequate but not overly saturated. Limit pruning to the removal of damaged branches only. A second irrigation of the newly planted tree completes the process.

- Bare root stock. Deciduous bare root trees are occasionally used as street trees or in off-street locations. A bare root tree is 40 to 70 percent less expensive than the same size tree purchased in a container. If properly planted and maintained, bare root plants will establish them-

selves more quickly and often better than trees planted from containers. This is because the characteristics of the soil in the container will usually differ from those of the surrounding soil, making it difficult to get uniform water distribution in the root zone area.

To plant a bare root tree, make a firm cone of soil in the planting hole, nearly reaching the surface. Place the roots radially about the cone without bending or cutting them. Plant the tree so that it is slightly higher (1") than its original planting depth to allow for eventual settlement. Backfill soil nearly to the surface and slowly add water. Adjust plant height as required by gently lifting upward. After the correct level is established, add necessary additional soil. When growing season begins, build a watering basin to the same diameter as the roots.

Maintenance

Proper maintenance practices are a crucial element in an urban forestry program. This is particularly true in San Francisco, where the environment is often unfavorable. Newly planted trees should be carefully monitored to determine suitability to specific climatic conditions. Horticultural practices such as pruning and watering can significantly influence a tree's growth rate and overall vigor.

One procedure common to all trees is basin maintenance. This should be scheduled annually or more often, if needed. It consists of weed and debris removal, stake and strap adjustment or removal, sucker/water sprout removal and, in the case of street trees, adjustment of tree basin covers, grates, bricks, or paving stones.

Maintenance of Newly Planted Trees. During regular inspections, vigor and general condition may be observed and appropriate maintenance scheduled. Irrigation of newly planted trees is usually the single-most important maintenance practice. Our dry summers require irrigating newly planted trees from late spring through fall. The City's wide variety of soil conditions call for careful monitoring to see that each tree's water needs are met (see "Watering" for further discussion).

The vertical and horizontal (radial) arrangement of scaffold branches to develop vigorous and structurally sound trees is determined during the first few years' growth. Pruning should emphasize the plant's natural growth habit and be limited to thinning cuts and removal of unsound or poorly attached branches. The most important aspect of young tree pruning is the establishment of a dominant leader; heading cuts to lateral branches should be done only to promote this end. Temporary lateral branches (branches that will not be present on the mature tree) must be left to feed and shade the trunk. These branches, which may also be headed appropriately, will be removed only after the tree is firmly established.

Inspection of stakes and ties can be undertaken during the previously described maintenance procedures and any that damage the tree removed. As soon as the tree is established (minimum of two years), the stakes should be removed or modified to encourage a strong trunk, deep rooting and anchorage.

Maintenance of Established Trees. Tree pruning is the largest and most important component of mature tree maintenance. Street trees are subject to wind throw, structural damage, sometimes obstruct traffic signs or street lighting, and can create other hazards due to the size and density of the canopy. These problems can be reduced or eliminated by using proper pruning techniques as outlined in Richard Harris' Arboriculture of Trees, Shrubs, and Vines in the Landscape:

1. Crown cleaning or the removal of dead, dying, diseased, weakly attached and/or low-vigor branches from the tree crown.

2. Crown thinning includes crown cleaning plus selective removal of branches to increase light penetration and air movement into the crown. This stimulates and maintains interior foliage which in turn improves branch taper and strength. Reduction of the wind sail effect (primary cause of branch failure) and the weight of heavy limbs is another benefit. Thinning the crown can also emphasize the

structural beauty of the trunk and branches. It is important, however, that no more than 30 percent of the foliage be removed in any one growing season.

When thinning laterals from a limb, selected interior branches should be retained to reduce structural stress and maintain a natural appearance. Lion's-tailing, i.e. removing all the internal lateral branches but the tip, should be avoided. Removing excessive inner foliage may result in water sprouts, sunscald and limb breakage.

3. Crown reduction is used to decrease the height and/or spread of a tree. To be successful, the lateral to which a branch or trunk is cut should be at least one-third to one-half the diameter of the cut being made. Thinning cuts are regarded as more effective in maintaining the structural integrity and natural form of a tree and in lengthening the time until the next pruning.

4. Crown restoration improves the structure and appearance of trees that have been topped or improperly pruned. Selected vigorous laterals are developed to assume the major scaffolding branches of the tree. It generally requires two to three seasons of this type of pruning before a tree can regain its natural shape.

5. Pollarding refers to cutting back one or two years' growth to the previous cuts. This practice, while used effectively in several formally landscaped areas in the City, should be selectively employed. Species such as Platanus acerfolia and Ulmus pumila are occasionally pollarded; examples can be seen at the Music Concourse in Golden Gate Park and at Civic Center.

6. Crown raising is the removal of lower lateral branches to provide more vertical clearance.

These pruning techniques work best when combined with specific pruning standards. The 1988 edition of the "Pruning Standards of the Western Chapter of the International Society of

Arboriculture," exerpted below, serves as the City's specifications manual:

Pruning cuts should be made outside the branch bark ridge and thinning cuts to a lateral at least one-third the diameter of the branch being removed.

Crotches with embedded bark, indicating weakness, should be removed.

Laterals competing in size with the main leader should be headed back or dwarfed through thinning.

Branch spacing should be evenly developed both vertically and radially throughout the main trunk.

Cuts should be smooth and clean with the bark firmly attached to the wood. Large limbs should be cut in sections, using the undercut method to avoid ripping the bark below the cut.

Knowledge of species' characteristics is extremely important in proper pruning. The following species respond to heavy pruning with increased growth rates ahd should be thinned moderately: Acacia melanoxylon, Ulmus parvifolia, Eucalyptus spp. Tree species' that should not have their terminal buds cut include Ficus microcarpa, Pittosporum undulatum, Liquidambar styraciflua and Magnolia grandiflora. Acacia longifolia, A. baileyana, Pinus radiata, Cupressus macrophylla and Leptospernum laevigatum are among the species that should not have their limbs cut beyond the active growth area.

Not all trees need annual or bi-annual pruning; growing conditions and species' characteristics both influence the level of pruning required. Early tree care emphasizing proper scaffold development will drastically reduce pruning requirements for established trees.

Pavement Damage and Root Pruning. Mature trees can cause extensive sidewalk and pavement damage by the uplifting effects of root growth. Although almost any tree will cause sidewalk displacement if planted in a small basin (3'-square or

less), trees especially troublesome have been surface-rooted species such as Fraxinus uhdei, Myoporum laetum and Schinus molle.

Public Works' Bureau of Engineering sidewalk inspectors systematically survey the City's sidewalks, noting where they have been displaced more than one-half inch. The inspector measures the area of displaced pavement and notifies the responsible party, i.e. the abutting property owner unless the tree is maintained by the Department of Public Works, Urban Forestry Division. The Bureau of Engineering also dispatches inspectors to investigate citizen complaints regarding sidewalk damage. In addition, the Department of Public Works, Urban Forestry Division notifies them of any sidewalk displacement caused by trees it maintains. Corrective work for displaced paving involves replacing the damaged section and root pruning, if necessary.

All roots in the top 4"-6" of soil are cut and removed and deep rooting encouraged by pruning back to downward-growing roots. When practical, the same guidelines and standards for general canopy pruning are followed, with the placement of the pruning cut determining growth direction.

Root pruning, as with all pruning, should always be done or supervised by a trained aborist. Concrete or other construction contractors should be permitted to root-prune trees only with proper direction. Urban Forestry will advise private property owners of the criteria for selecting a competent tree care company.

Tree Removal. The removal of a tree in an urban location is a sometimes necessary, but always costly and time-consuming process that often reveals the profound attachment people may have for the tree(s) scheduled for removal. Thus, any individual or agency considering removing a tree should carefully evaluate alternatives before proceeding. Causes for tree removal include:

1. The hazard of tree or limb failure is either a present danger or will become so in the next few years.

2. The tree diminishes the amount of sunlight available to a nearby home or garden.

3. The tree interferes with the efficient operation of an existing solar energy system.

4. Landmarks, vistas or other unique features cannot be seen or are diminished because of a tree's growth.

5. The tree has a deleterious effect upon nearby vegetation through the loss of heat and light.

6. The tree serves as a host to a life-threatening pest or disease which may spread to other trees.

7. The tree's roots have repeatedly damaged pavement or sewer lines, and the cost of repair exceeds its amenity value.

8. The root cutting required to restore damaged pavement would jeopardize the tree's stability or health.

9. The tree is an obstruction to construction and cannot be preserved by special grading, construction or revisions to the site plan.

Two Public Works Code amendments relating to the process of tree removal have been enacted by the City and County of San Francisco: the Urban Forestry Ordinance; and the Tree Dispute Resolution. The Ordinance established the permit process for street tree removal and penalties for unlawful removals. The Tree Dispute Resolution set down procedures for resolving tree disputes between private property owners (see Appendix, Urban Forestry Codes). Both act to involve contemplated tree removal in a careful cost-benefit analysis.

Stump Removal. Tree stumps should always be ground down or pulled out when removing a tree. If left to rot, they can breed fungus infections or insect infestations which may spread to nearby trees. Most stumps should be removed to a depth of 12".

Recycling Tree Waste. The debris resulting from tree pruning and removal should be recycled as much as possible. Branches which can be efficiently chipped may be used as a groundcover mulch to reduce irrigation requirements and weed growth. Tree debris which is not chipped for mulch may be disposed of at recycling centers for processing into paper pulp. The Pacific Yellow Pages lists these businesses under "Recycling".

Watering. A fundamental goal of The Trees of San Francisco is for the bulk of the trees in the City's urban forest to be well adapted to our rainfall patterns. This will minimize both maintenance costs and water consumption.

Proper irrigation practices - deep, infrequent and slow watering - promote deep root growth that will sustain a tree through droughts. Watering tubes facilitate deep watering once a tree is established. The roots of newly planted trees, however, are very susceptible to drying out. Depending on soil type, plant requirements and climatic conditions, a newly planted tree should receive about fifteen gallons of water a week during the dry season at a rate of one gallon per minute.

While San Francisco does not generally experience high temperatures, evaporating winds are common. Water schedules should be adjusted to any fluctuations in such microclimatic patterns. One rule of thumb - if the top 3"-4" are dry, it's time to water - applies in general to all combinations of soil type and climatic conditions.

Root irrigators (hose-end attachments resembling giant hypodermic needles) are useful in watering established trees planted without watering tubes. They are especially useful on steep slopes, where surface watering often results in run-off.

Fertilizing. Fertilizing is most frequently done when a tree is first planted. Slow-release fertilizer in tablets or granules may be evenly distributed in the planting hole at about one-third the depth of the rootball or as recommended by the manufacturer. For optimum growth during the first five years, a slow-release, complete fertilizer can be applied annually in March. It should

be delivered to the root zone using watering tubes or by drilling small holes 12"-18" deep approximately 3" apart within the drip line. Deep fertilization is preferable to surface application as the latter encourages surface rooting and weed growth. Also, phosphorus and potassium do not disperse well through the soil.

Integrated Pest Management. Integrated pest management (IPM) is an approach to pest control that emphasizes the use of natural insect predators, horticultural practices, and mechanical devices over chemical "cures". City agencies and property owners are encouraged to carefully evaluate whether the presence of a pest or disease is truly endangering the life or productivity of certain trees, and if so, what corrective measures would pose the least danger to the urban ecology.

Field Personnel Training. Urban forestry personnel should receive thorough technical training. For example, the Department of Public Works, Division of Urban Forestry currently has a contract with the University of California Cooperative Extension horticultural advisor to provide training in tree planting, early tree care, and pruning. Regular exchanges between supervisors and maintenance crew members provide opportunities for any necessary modifications to maintenance practices.

Comprehensive safety programs based on Occupational Safety and Health Administration (OSHA) and American National Safety Institute standards should be developed and regular meetings scheduled to discuss safety procedures. Tree crews need to receive special training in electrical hazards associated with tree work, as well as aerial rescue techniques. Finally, Hazardous Material Awareness Training (HAZMAT) and classes in "Right to Know Laws" should be attended by all field staff.

Management Practices

Management practices deal with those aspects of an urban forestry program concerned with monitoring a forest's health and determining its character. Efficacy is, in large part, dictated by the operating budgets of the urban forestry or grounds

division of the public agencies and private interests managing properties with trees. An adequately funded urban forestry program can inventory its trees, rationally plan new and replacement tree plantings, and efficiently schedule field maintenance.

Tree Inventory. The most effective administration of any tree population begins with an inventory. A computerized inventory can provide a richly detailed picture of each tree managed by an agency or organization. Several agencies in San Francisco have conducted tree inventories: the Division of Urban Forestry carried out an inventory of the trees under its jurisdiction in 1989; in 1982, Recreation and Park completed a tree assessment program evaluating the hazard potential of individual trees in its neighborhood parks; and the Water Department has inventoried its trees at Crystal Springs Reservoir. A tree inventory can include such factors as:

- location/address
- description (botanical name, size, girth)
- health (vigorous, declining, dead)
- problems (diseases, wind or water stress, insect infestations, sidewalk damage, physically observable structural defects)
- maintenance to be performed (pruning, stump removal, watering, staking)

An up-to-date inventory is an excellent tool for measuring two important urban forestry concepts: useful lifespan and rotation management.

Useful Lifespan. Useful lifespan is the length of time a tree can be expected to remain healthy or its maintenance costs (sidewalk repairs, pruning, etc.) not exceed its amenity value. The useful lifespan of species varies considerable. Some are inherently short-lived (e.g. Acacia, Dodonea), while others, such as the Coast Live Oak and Coast Redwood can live on for centuries before they decline.

Environmental conditions often associated with San Francisco's

street tree plantings can considerably shorten useful lifespan. Specific examples are undersized tree basins and overhead utility wires. In addition, only a relatively limited number of trees are well-suited to San Francisco's windy streets, low amount of annual rainfall with recurring summer dought, and narrow building setbacks.

Since the removal of a street tree is expensive and often agitating to the community, species selection should be made with extreme care. An inventory can be useful in the selection process by identifying which trees have excessive maintenance requirements or are showing signs of stress in particular locations. Informed choices can then be made when replacing these trees or in choosing trees for sites with similar conditions.

Rotational Management. Alternating trees at different ages or of different species is often termed "rotational management". This approach avoids wholesale replacement of trees that have all reached the end of their useful lifespan at the same time. An inventory of the urban forest can identify areas where this could be introduced to replace monocultural (single species) plantings.

Rotational management goals must be weighed against aesthetic objectives, particularly on major and secondary thoroughfares. The visual qualities of a monocultural planting of large trees are often desired in these locations. Staggering installation and removal dates of a single species planting and vertically layering short and tall trees with dissimilar lifespans are two strategies for minimizing the effects of coincident declines and removal at a single location.

Administrative Procedures

Administrative procedures refer to policies and codes governing the urban forestry activities of public agencies, private organizations and concerned individuals. The Goals and Objectives section of The Trees of San Francisco identifies the common interests of such entities as the Departments of Public Works, Recreation and Park and City Planning as well as Friends of the Urban Forest. All play a vital role in the management of the City's urban forest.

Urban Forestry Codes

The Planning and Public Works Codes related to trees are discussed earlier in this chapter and their text provided in full in the Appendix. They are designed to optimize the benefits derived from the City's trees, and reduce public hazards, nuisances, expenses and conflicts resulting from improper tree selection and/or maintenance.

Community Liaison

The design guidelines and recommendations given in the Tree Management Plan chapter and the Field Practices section of this chapter describe in considerable detail how trees in San Francisco may be optimally planted and cared for. Implementation of these recommendations, however, depends upon the concerted efforts of such groups as the Department of Public Works, Urban Forestry Division, Recreation and Park, Friends of the Urban Forest and other organizations to promote and encourage public participation in planning for and managing the City's trees.

The importance of an informed and involved citizenry to the viability of San Francisco's urban forest cannot be overstressed. Citizens can influence the role of public and private sectors in developing the City's urban forest. Potential issues which might be addressed include:

- Expanding the Department of Public Works, Division of Urban Forestry's maintenance responsibilities to include all the City's major and secondary thoroughfares. This would provide a consistent level of maintenance and help ensure implementation of the recommendations made in this publication.

- Improving the grounds of public institutions - schools, hospitals, libraries, jails - with additional tree plantings.

- Improving the aesthetic quality of neighborhood commercial areas with street tree plantings.

- Promoting the use of orchards wherever practicable, such as community gardens or on commercial properties with controlled access.

- Assuring the renewal of tree plantings in the City's open spaces and watershed lands.

- Improving the aesthetic quality of industrial areas with trees to screen views or enhance use areas.

- Revising review procedures and codes governing City agencies in regard to new development proposals relating to off-street areas (e.g. parking lots adjacent to public rights-of-way).

There is a wide range of opportunities available to individuals, groups and organizations interested in contributing to the management of San Francisco's urban forest. Four ways the public can share in this undertaking are discussed below. Further information may be found in the Resources Guide in the Appendix.

Policy Formulation. Citizens are encouraged to become involved with the Tree Advisory Board. Established in 1986 by the Urban Forestry Ordinance, it is composed of fifteen private citizens, at least five of whom are professionally trained and experienced in a tree-related field. Serving in an advisory capacity to the Director of Public Works, it meets at least six times a year. These meetings provide an excellent forum for voicing concerns about more effective management of the City's urban forest.

Urban Forestry Education. Some activities in this area in San Francisco are:

- The Education Committee of the Tree Advisory Board has developed a proposal for designating Landmark Trees and Distinctive Trees (see the Tree Management Plan chapter).

- Publications promoting urban forestry are available for public use: Friends of the Urban Forest's Trees for San Francisco, a guide for street tree planting and care; City Trees, a

75-unit urban forestry curriculum guide adopted by the San Francisco Unified School District; and Treescapes, an urban forestry quarterly newsletter. The Department of Public Works has published the Urban Forest Information Booklet, as well as directed the publication of The Trees of San Francisco.

- The Department of Public Works, Urban Forestry Division and Friends of the Urban Forest hold outreach community meetings promoting "tree awareness".

- Friends of the Urban Forest conducts tree tours providing historical background on the City's heritage trees as well as illustrating appropriate species selection and uses.

Opportunities for Public Participation. The most accessible activity available is probably tree planting. Individual property owners can plant a tree on private property or apply for a street tree planting permit. Friends of the Urban Forest will assist in street tree plantings of thirty trees or more. Plantings of a celebratory nature may be scheduled to occur on Arbor Day, observed in San Francisco on the first Saturday in November.

Financial Support. Urban Forestry and Friends of the Urban Forest both have tax-deductible programs for individuals and organizations wishing to make financial contributions to the City's urban forestry efforts. On a larger scale, the American Forestry Association is sponsoring a program called "Global Releaf" to counter an apparent world-wide warming trend (trees reduce temperatures by removing carbon dioxide from the atmosphere). Global Releaf aims to plant 100 million trees in the United States by 1992. The State program, California Releaf, intends to plant 20 million trees by the year 2000.

Review and Update of The Trees of San Francisco

The Department of Public Works, with the Tree Advisory Board, shall conduct a comprehensive review of The Trees of San Francisco every five years, beginning in 1996. These reviews shall give special emphasis to evaluating progress toward achieving the

Plan's goals and objectives. Toward that end, a plenary congress of all agencies and organizations involved in the management of the City's urban forest shall be an integral part of the review process. Any recommended changes to policies and codes shall be approved by the Tree Advisory Board. Minor changes to the Plan, such as revisions to the recommendations for major and secondary thoroughfares, may be made by Urban Forestry at any time with the prior approval of the Tree Advisory Board.

Inter-Agency Cooperation. Many different agencies and organizations are currently charged with managing San Francisco's urban forest. Most of them, however, have not been constituted with this as their primary purpose. As a consequence, urban forestry matters often receive a low priority and are budgeted accordingly.

Despite fiscal constraints, urban forestry divisions of Public Works and Recreation and Park and Friends of the Urban Forest have provided leadership in realizing the goals and objectives set forth in the management plan. A great deal more needs to be done before the urban forestry agenda is reflected in the annual budgets of public agencies and receives widespread support of the general public.

A forum for the development of a broadly-based urban forestry coalition could be the Tree Advisory Board. Ex-officio Board members represent Public Works, Recreation and Park, Friends of the Urban Forest, Water Department, City Planning and the University of California Extension. This bridging of administrative lines can be very beneficial in raising public awareness of the significance of the urban forest in our personal lives and community.

It is our hope this publication will provide the catalyst for a comprehensive effort which in time will alter the face of the City.

APPENDICES

Accent Tree: A distinct tree, often small and colorful, used to designate an area or provide additional interest in an otherwise uniform planting.

Avenue Tree: A tree used in a single row to line both sides of a road.

Commercial Node: An area with a high rate of pedestrian and vehicular traffic due to a concentration of business.

Conifer: Cone-bearing plants, mostly evergreens, including pines and yews.

Deciduous: Plants which shed their leaves seasonally, usually in the fall or winter.

Distinctive Tree: A designation given to a noteworthy tree or group of trees not under the jurisdiction of the Department of Public Works.

Dominant Tree: The primary tree species on a street used to create a specific character or image.

Evergreen: Plants having foliage that remains and is functional through more than one growing season.

Forest: A community of trees and shrubs in all stages of growth and decay.

Grove: A grouping of trees, smaller than a forest, without shrub undergrowth. Groves can be formal, as in orchard plantings, or naturalistic.

Hedgerow: Rows of trees, often with a shrub understory, used as windbreaks and spatial enclosures.

Landmark Tree: A designation given to a noteworthy tree or group of trees within the City's limits.

Major Thoroughfare: Cross-town routes whose primary function isto link districts within the City and distribute traffic to and from the freeways.

Microclimate: The essentially uniform climate of a site within the context of a larger, more varied climate zone.

Pollarding: A pruning style in which the main limbs of a tree are periodically cut back to short lengths. The ends develop scar tissue and become enlarged creating a knobby appearance.

Residential Density: The San Francisco Department of City Planning residential density classifications are:

Low Density Residential: an area with an average of 14 units per acre.

Moderately Low Density Residential: an area with an average of 36 units per acre.

Medium Density Residential: an area with an average of 54 units per acre.

Moderately High Density Residential: an area with an average of 91 units per acre.

High Density Residential: an area with an average of 282 units per acre.

Secondary Thoroughfare: Primarily intra-district routes of varying capacity, serving as collectors for the major thoroughfares.

Single Specimen: A tree with an impressive characteristic, such as size, flowers or form, planted alone in a conspicuous location.

Species: The fundamental biological classification of plants and animals. Species members have a high degree of similarity, can interbreed only among themselves, and can be distinguished from other species by at least one characteristic. The second

word in a plant's botanical name designates the species.

Standard Tree: A shrub or multi-trunked tree that has been pruned to a single trunk.

Sucker: A vigorous shoot growing from the base of a tree.

Trees are listed alphabetically by botanical number under three categories:

Sidewalk Trees - trees proven to be suitable for sidewalk locations.

Trial Sidewalk Trees - those trees which are climatically suitable for planting in San Francisco but have not been used in sufficient numbers to establish reliability.

Median and Off-Street Trees - trees whose shape is suitable for use in those two locations.

In the botanical name, the capitalized first word is the genus, followed by the species name in lower-case. Occasionally, there is a a third name, the cultivar, which is capitalized and shown in quotation marks. A cultivar is a hybrid variety propagated vegetatively for certain characteristics such as ability to resist disease, leaf color, canopy shape, etc.

The factors describing each tree are listed along the tops of both pages. They are defined as follows:

Type: Broadleaf evergreen trees keep their leaves all year and deciduous trees shed their leaves, usually in the fall or winter. Coniferous trees are cone-bearing plants, mostly evergreens, and often have needles instead of leaves. Palm trees have a simple stem and a terminal crown of large pinnate or fan-shaped leaves.

Density: A tree's leaf texture and limb structure determine density, which in turn affects the degree of shade or screening it provides.

Texture: The foliage type and size produce a texture ranging from fine to coarse.

Climatic Zone: See climate zone descriptions, Figure 2 page 23.

Possible Sites: Neighborhood streets distribute low volumes of traffic within a District. Commercial streets provide access to retail/commercial land uses and are characterized by relatively high volumes of pedestrian and vehicular traffic. Secondary and major thoroughfares are defined on page 256. A parkway is a public right-of-way with a landscape area at least 25' in width.

SAN FRANCISCO TREE MATRIX

	Botanical Name / Common Name / 'Cultivated Variety'	Type of Tree				Height				Density			Shape						Growth Rate Per Year			Texture			Climatic Zone			
		Broadleaf Evergreen	Deciduous	Coniferous	Palm	Up to 15'	15' to 30'	30' to 50'	Over 50'	Open	Medium	Dense	Round	Spreading	Columnar	Oval	Upright	Pyramidal	6" Max • Slow	Moderate	1' Min • Rapid	Fine	Medium	Coarse	1A • Coastal	1B • Inland Coastal	2 • Transition	3 • Bay
	SIDEWALK TREES																											
1.	Acacia baileyana Purple-Leaf Acacia 'Purpurea'	●					●			●			●	●							●	●				●	●	●
2.	Acacia longifolia Sydney Golden Wattle	●					●					●	●								●		●		●	●	●	●
3.	Acacia melanoxylon Blackwood Acacia	●							●			●				●					●		●		●	●	●	●
4.	Aesculus carnea Ruby Horse Chestnut 'Briotii'		●					●				●	●				●			●				●			●	●
5.	Alnus cordata Italian Alder		●					●				●				●					●			●			●	●
6.	Arecastrum romanzoffianum Queen Palm				●			●		●							●			●			●		●	●	●	●
7.	Callistemon citrinus Lemon Bottlebrush	●				●					●		●							●		●	●		●	●	●	●
8.	Callistemon viminalis Weeping Bottlebrush	●					●			●				●						●			●		●	●	●	●
9.	Celtis sinensis Chinese Hackberry		●					●			●		●							●		●					●	●
10.	Ceratonia siliqua Carob	●					●					●	●						●				●				●	●
11.	Crataegus laevigata English Hawthorn		●				●				●			●						●			●				●	●
12.	Cupaniopsis anacardioides Carrot Wood	●					●				●		●						●					●		●	●	●
13.	Drimys winteri Winter's Bark	●					●				●					●			●					●		●	●	●
14.	Eriobotrya deflexa Bronze Loquat	●					●					●	●							●				●		●	●	●
15.	Eucalyptus ficifolia Red-Flowering Gum	●					●	●				●	●							●				●		●	●	●
16.	Eucalyptus lehmannii Bushy Yate	●					●					●	●	●						●					●	●	●	
17.	Eucalyptus nicholii Nichol's Willow-Leafed Peppermint	●						●		●							●				●	●					●	●

Sun Exposure			Tolerances			Life of Tree		Outstanding Characteristics								Problems			Possible Sites								Comments	
Sun	Sun • Shade	Shade	Drought	Wind	Oak Root Fungus Resistant	20 to 40 years	Over 40 years	Aromatic	Attracts Birds	Fruit • Flower	Fall Color	Unusual Leaves	Clean • Neat	Bark	Silhouette	Sidewalk Damaging	Flower • Fruit Drop	Wind Intolerant	Neighborhood St.	Commercial Street	2nd Thoroughfare	Major Thoroughfare	Parkway	Lawn	Parking Lot • Plaza	Open Space • Park		
●	●	●	●			●		●		●		●							●				●		●	●	Cut back to encourage new growth and prolong foliage color	1.
●	●	●	●	●	●	●				●						●			●				●			●	Does not resprout when pruned back to old growth	2.
●	●	●	●	●			●									●						●	●	●		●	Suckers and self-sows	3.
●							●			●								●	●		●	●		●	●	●	Best in irrigated lawn areas; not readily available	4.
●	●			●			●															●	●	●		●	Subject to root rot in poorly-drained soils	5.
●	●	●	●	●	●	●			●			●			●			●	●	●	●	●	●	●	●	●	Fronds tend to break in high winds; subject to mites	6.
●	●		●	●		●		●	●	●							●		●	●	●					●	Useful in narrow sidewalks	7.
●	●		●	●		●			●	●									●	●			●	●	●	●	Attracts bees; good for narrow sidewalks; tolerates poor drainage	8.
●	●	●	●	●			●												●	●	●		●	●	●	●	Plant male trees only	9.
●	●		●		●	●										●			●		●			●	●	●	Prone to suckering	10.
●						●			●	●									●		●		●			●		11.
●			●	●	●	●						●	●						●		●	●	●	●	●	●		12.
●	●			●		●		●		●													●	●		●	Subject to fireblight and leafspot; leaf drop a litter problem	13.
●	●		●			●			●	●		●							●	●			●	●	●	●	Needs considerable space; messy capsules; subject to bark flux	14.
●	●		●	●			●	●	●	●						●	●		●		●	●	●		●	●		15.
●			●	●		●		●		●														●		●	Shallow rooted — do not plant in sandy soil	16.
●			●	●		●		●											●		●	●	●			●		17.

SAN FRANCISCO TREE MATRIX

	Botanical Name / Common Name / 'Cultivated Variety'	Type of Tree				Height				Density			Shape						Growth Rate Per Year			Texture			Climatic Zone			
		Broadleaf Evergreen	Deciduous	Coniferous	Palm	Up to 15'	15' to 30'	30' to 50'	Over 50'	Open	Medium	Dense	Round	Spreading	Columnar	Oval	Upright	Pyramidal	6" Max • Slow	Moderate	1' Min • Rapid	Fine	Medium	Coarse	1A • Coastal	1B • Inland Coastal	2 • Transition	3 • Bay
	SIDEWALK TREES (cont'd)																											
18.	Ficus microcarpa Indian Laurel Fig	●							●			●	●							●			●				●	●
19.	Fraxinus holotricha Moraine Ash 'Moraine'		●					●			●		●								●		●					●
20.	Fraxinus oxycarpa Raywood Ash 'Raywood'		●						●		●		●								●		●				●	●
21.	Geijera parviflora Australian Willow	●					●				●		●							●		●					●	●
22.	Ginkgo biloba Maidenhair Tree 'Autumn Gold' 'Fairmont'		● ● ●					● ● ●		● ● ●				● |				● ● ●			● |	● ● ●				● ● ●	● ● ●
23.	Gleditsia triacanthos 'Shademaster'		●				●			●							●			●		●						●
24.	Hakea laurina Sea Urchin Tree	●					●					●	●			●			●				●		●	●	●	●
25.	Hymenosporum flavum Sweetshade	●					●				●						●			●			●				●	●
26.	Laurus nobilis Sweet Bay	●					●					●	●						●				●			●	●	●
27.	Ligustrum lucidum Glossy Tree Privet	●					●					●	●							●			●				●	●
28.	Liquidambar styraciflua American Sweet Gum 'Burgundy' 'Palo Alto'		● ● ●					● 		● ● ●					● ● ●	● 				● ● ●	● ● ●		● ● ●				● ● ●	● ● ●
29.	Liriodendron tulipifera Tulip Tree		●						●		●					●					●		●	●			●	●
30.	Magnolia grandiflora Southern Magnolia 'Majestic Beauty' 'Russet' 'Saint Mary' 'Samuel Sommer'	● ● ● ●					● ● ●	● ● ●				● ● ●		● ● ●	● |				● ● ●				● ● ●	● ● ●			● ● ●	● ● ●
31.	Maytenus boaria Mayten Tree	●					●				●		●	●					●			●					●	●

Sun Exposure: Sun	Sun Exposure: Sun • Shade	Sun Exposure: Shade	Tolerances: Drought	Tolerances: Wind	Tolerances: Oak Root Fungus Resistant	Life of Tree: 20 to 40 years	Life of Tree: Over 40 years	Outstanding Characteristics: Aromatic	Outstanding Characteristics: Attracts Birds	Outstanding Characteristics: Fruit • Flower	Outstanding Characteristics: Fall Color	Outstanding Characteristics: Unusual Leaves	Outstanding Characteristics: Clean • Neat	Outstanding Characteristics: Bark	Outstanding Characteristics: Silhouette	Problems: Sidewalk Damaging	Problems: Flower • Fruit Drop	Problems: Wind Intolerant	Possible Sites: Neighborhood St.	Possible Sites: Commercial Street	Possible Sites: 2nd Thoroughfare	Possible Sites: Major Thoroughfare	Possible Sites: Parkway	Possible Sites: Lawn	Possible Sites: Parking Lot • Plaza	Possible Sites: Open Space • Park	Comments	
●	●	●				●	●						●			●		●			●			●	●	●	Prefers summer irrigation and well-draining soils; susceptible to root rot; good container specimen	18.
●	●						●				●					●			●					●		●		19.
●	●		●	●	●	●	●				●	●				●					●	●	●		●	●	Train when young	20.
●			●		●	●						●	●					●	●		●		●		●			21.
●	●		●●●		●●●		●●●				●●●	●●●						●●●	●	●	●●●	●●●	●●●	●	●●●	●	Drought tolerant in non-sandy soils; varieties are non-fruiting; pest and smog tolerant	22.
●			●		●		●				●					●		●			●	●		●	●	●	Use root control barrier; 'Shade master' more upright and faster growing	23.
●			●	●		●				●			●						●						●		Brittle wood	24.
●	●					●		●		●									●	●	●				●	●	Brittle wood; bark susceptible to sunscald; requires well-draining soil; long flower season	25.
●	●	●	●	●		●		●					●			●								●		●	Can be clipped into formal shapes; subject to mealybug, aphid, and scale	26.
●	●	●				●				●							●		●		●			●	●		Fruit drop stains paving	27.
●●●	●●●				●●●		●●●				●●●	●●●				●●●				●	●●●	●●●	●●●	●●●	●●●	●●●	Use root-control barrier; do not plant under power lines; tolerates poor drainage	28.
●	●				●		●				●	●										●	●	●	●	●	Highly susceptible to aphids; takes wind in Zone 3	29.
●●●●	●●●●				●●●●		●●●●			●●●●		●●				●●●●	●●●●	●●●●	●●●●	●●●	●●●●	●●		●●●●	●●●●	●●●●	Leaf drop may be a problem; 'Saint Mary' good in containers	30.
●	●	●			●		●									●		●	●		●			●	●	●	Weeping character; likes water; suckers from roots	31.

SAN FRANCISCO TREE MATRIX

	Botanical Name / Common Name / 'Cultivated Variety'	Type of Tree				Height				Density			Shape						Growth Rate Per Year			Texture			Climatic Zone			
		Broadleaf Evergreen	Deciduous	Coniferous	Palm	Up to 15'	15' to 30'	30' to 50'	Over 50'	Open	Medium	Dense	Round	Spreading	Columnar	Oval	Upright	Pyramidal	6" Max • Slow	Moderate	1' Min • Rapid	Fine	Medium	Coarse	1A • Coastal	1B • Inland Coastal	2 • Transition	3 • Bay
	SIDEWALK TREES (cont'd)																											
32.	Melaleuca linariifolia Flaxleaf Paperbark	●					●				●	●	●							●		●				●	●	●
33.	Melaleuca quinquenervia Cajeput Tree	●					●				●					●				●			●		●	●	●	●
34.	Melaleuca styphelioides	●						●			●	●				●				●		●				●	●	●
35.	Metrosideros excelsus New Zealand Christmas Tree	●					●	●				●	●							●			●		●	●	●	●
36.	Myoporum laetum Myoporum	●					●					●	●						●				●		●			
37.	Olea europaea Olive 'Fruitless' 'Swan Hill'	●					●				●		●							●		●				●	●	●
38.	Persea indica Madeira Bay	●					●					●				●				●				●			●	●
39.	Pistacia chinensis Chinese Pistache 'Keith Davey'		●					●			●		●						●	●			●					●
40.	Pittosporum eugenioides	●					●	●				●				●					●		●			●	●	●
41.	Pittosporum rhombifolium Queensland Pittosporum	●					●				●		●						●				●		●	●	●	●
42.	Pittosporum undulatum Victorlan Box	●						●			●		●							●			●			●	●	●
43.	Platanus acerifolia London Plane Tree 'Bloodgood' 'Yarwood'		● ●					● ●			● ●			● ●							● ●			●		●	● ●	● ●
44.	Prunus blireiana Flowering Plum		●				●				●		●						●				●				●	●
45.	Prunus serrulata Japanese Flowering Cherry 'Amanogawa' 'Kwanzan'		● ●				● ●				● ●			● ●			● ●				● ●		● ●				● ●	● ●
46.	Prunus yedoensis 'Akebono'		●				●			●				●							●		●				●	●
47.	Pyrus calleryana 'Aristocrat' 'Bradford' 'Chanticleer' 'Red Spire' 'Whitehouse'		● ● ● ● ●					● ● ● ● ●			● ● ● ● ●				● ●	●		● ● ● ● ●		● ● ● ● ●			● ● ● ● ●				● ● ● ● ●	● ● ● ● ●

Sun Exposure: Sun	Sun Exposure: Sun • Shade	Sun Exposure: Shade	Tolerances: Drought	Tolerances: Wind	Tolerances: Oak Root Fungus Resistant	Life of Tree: 20 to 40 years	Life of Tree: Over 40 years	Outstanding Characteristics: Aromatic	Outstanding Characteristics: Attracts Birds	Outstanding Characteristics: Fruit • Flower	Outstanding Characteristics: Fall Color	Outstanding Characteristics: Unusual Leaves	Outstanding Characteristics: Clean • Neat	Outstanding Characteristics: Bark	Outstanding Characteristics: Silhouette	Problems: Sidewalk Damaging	Problems: Flower • Fruit Drop	Problems: Wind Intolerant	Possible Sites: Neighborhood St.	Possible Sites: Commercial Street	Possible Sites: 2nd Thoroughfare	Possible Sites: Major Thoroughfare	Possible Sites: Parkway	Possible Sites: Lawn	Possible Sites: Parking Lot • Plaza	Possible Sites: Open Space • Park	Comments	
●	●		●	●		●				●		●		●					●	●	●				●	●	Susceptible to chlorosis; brittle wood; less wind tolerant than other Melaleucas	32.
●			●	●		●							●	●					●		●	●			●	●	Good for narrow sidewalks; tolerates poor drainage; good container specimen	33.
●	●		●	●	●	●				●		●		●					●	●	●	●		●	●	●	Brittle wood	34.
●	●		●	●			●			●						●	●		●	●	●	●		●	●	●	Attracts bees; needs root-control barrier	35.
●	●	●	●	●		●				●		●				●	●									●	Needs root control barrier; best used in planting strip	36.
●			●	●			●							●	●		●		●	●	●		●		●	●	'Swan Hill' – fruitless variety 'Fruitless' is more spreading variety, and is only fruitless in Zone 1	37.
●	●		●		●	●												●				●		●	●	●	Susceptible to mealybug; brittle wood	38.
●			●	●			●			●	●						●	●	●	●	●	●		●	●	●	Limited availability; no central leader; requires maintenance when young; susceptible to verticillim wilt; use only in hot, sunny locations in Zone 3	39.
●	●		●	●		●		●	●	●							●		●		●		●			●		40.
●	●		●	●	●	●			●	●							●		●		●		●	●		●	Limited availability	41.
●	●		●	●		●		●		●							●		●	●	●			●	●	●		42.
●	●		●		●		●			●	●			●	●	●			●	●	●	●		●	●	●	Notably tolerant of urban conditions 'Bloodgood' – resistant to anthracnose; 'Yarwood' – resistant to powdery mildew	43.
●	●		●		●		●			●	●			●	●	●			●	●	●	●		●	●	●		
●						●		●		●								●	●	●				●	●	●	Fruitless; bronze-tinged foliage	44.
●						●				●	●	●		●			●	●									'Amanogawa' and 'Kwanzan' – Exceptional fall color; susceptible to root rot; requires regular irrigation and well-draining soil	45.
●						●				●	●	●		●			●	●	●					●	●	●		
●						●				●	●	●					●	●	●		●			●	●	●		46.
●					●	●				●	●								●	●	●	●		●	●	●	Requires early training to prevent low radial branching habit; narrow crotches subject to breakage as tree matures	47.
●					●	●				●	●								●	●	●	●		●	●	●		
●					●	●				●	●								●	●	●	●		●	●	●		
●					●	●				●	●								●	●	●	●		●	●	●		
●					●	●				●	●								●	●	●	●		●	●	●		

SAN FRANCISCO TREE MATRIX

	Botanical Name / Common Name / 'Cultivated Variety'	Type of Tree				Height				Density			Shape						Growth Rate Per Year			Texture			Climatic Zone			
		Broadleaf Evergreen	Deciduous	Coniferous	Palm	Up to 15'	15' to 30'	30' to 50'	Over 50'	Open	Medium	Dense	Round	Spreading	Columnar	Oval	Upright	Pyramidal	6" Max • Slow	Moderate	1' Min • Rapid	Fine	Medium	Coarse	1A • Coastal	1B • Inland Coastal	2 • Transition	3 • Bay
	SIDEWALK TREES (cont'd)																											
48.	Pyrus kawakamii Evergreen Pear	●				●	●				●			●					●				●				●	●
49.	Quercus ilex Holly Oak	●						●				●	●						●				●				●	●
50.	Rhamnus alaternus Italian Buckthorn	●					●					●	●								●		●		●	●	●	●
51.	Rhus lancea African Sumac	●					●			●				●			●		●			●					●	●
52.	Schinus molle California Pepper Tree	●					●					●	●							●		●				●	●	●
53.	Schinus terebinthifolius Brazilian Pepper Tree	●					●					●	●							●			●			●	●	●
54.	Trachycarpus fortunei Windmill Palm				●		●								●				●					●		●	●	●
55.	Tristania conferta Brisbane Box	●						●			●						●			●				●		●	●	●
56.	Tristania laurina Small-Leaved Tristania 'Elegant'	●					●				●	●	●			●			●				●			●	●	●
57.	Washingtonia robusta Mexican Fan Palm				●				●		●				●						●			●			●	●
	TRIAL SIDEWALK TREES																											
58.	Acer buergeranum Trident Maple		●				●				●		●	●						●			●				●	●
59.	Acer davidii David's Maple		●				●				●					●				●				●			●	●
60.	Acer oblongum Evergreen Maple	●					●				●		●							●				●			●	●
61.	Agonis flexuosa Australian Willow Myrtle	●					●					●		●						●			●			●	●	●
62.	Agonis juniperina Juniper Willow Myrtle	●					●				●			●							●	●				●	●	●
63.	Arbutus 'Marina'	●					●					●	●				●			●				●		●	●	●
64.	Cercis canadensis Eastern Redbud		●				●				●		●								●		●				●	●

Sun Exposure: Sun	Sun • Shade	Shade	Tolerances: Drought	Wind	Oak Root Fungus Resistant	Life of Tree: 20 to 40 years	Over 40 years	Outstanding Characteristics: Aromatic	Attracts Birds	Fruit • Flower	Fall Color	Unusual Leaves	Clean • Neat	Bark	Silhouette	Problems: Sidewalk Damaging	Flower • Fruit Drop	Wind Intolerant	Possible Sites: Neighborhood St.	Commercial Street	2nd Thoroughfare	Major Thoroughfare	Parkway	Lawn	Parking Lot • Plaza	Open Space • Park	Comments	
●	●					●				●								●	●	●	●		●	●	●	●	Susceptible to fireblight and leafspot	48.
●			●	●	●		●								●		●		●		●	●		●	●	●		49.
●	●		●	●		●							●		●				●	●	●					●	Needs room (12' sidewalk minimum)	50.
●			●	●		●							●	●					●	●	●		●	●	●	●	Needs training when young	51.
●			●	●		●	●		●	●						●	●		●					●		●	Susceptible to psylids; needs root-control barrier	52.
●			●	●		●			●	●						●	●		●		●		●		●	●	Needs root-control barrier	53.
●			●	●		●								●	●				●	●			●	●	●	●		54.
●	●		●	●		●	●			●			●	●		●			●	●	●	●			●	●	Good for narrow sidewalks	55.
●			●	●		●		●						●					●	●	●		●		●	●	Good for narrow sidewalks; tolerates poor drainage; multi-stemmed specimens good in containers	56.
●			●	●	●		●								●		●			●	●	●	●		●		Plant 12' high specimens, minimum; thorns may be a problem; attracts pigeons and rats	57.
	●			●			●				●					●			●					●		●	Requires moist soil; stake and prune to develop high branching	58.
●	●	●	●				●			●	●			●									●	●		●	New foliage bronze tinted; good fall color	59.
●	●	●	●				●					●						●					●	●		●	New foliage bronze-pink	60.
●		●	●	●			●	●				●												●		●	Weeping form; tolerant of a wide range of soil types and watering practices	61.
●	●		●	●		●		●		●									●	●					●	●		62.
●	●	●	●				●		●	●				●			●							●		●		63.
●			●			●				●		●											●		●	●		64.

SAN FRANCISCO TREE MATRIX

	Botanical Name / Common Name / 'Cultivated Variety'	Type of Tree				Height				Density			Shape						Growth Rate Per Year			Texture			Climatic Zone			
		Broadleaf Evergreen	Deciduous	Coniferous	Palm	Up to 15'	15' to 30'	30' to 50'	Over 50'	Open	Medium	Dense	Round	Spreading	Columnar	Oval	Upright	Pyramidal	6" Max • Slow	Moderate	1' Min • Rapid	Fine	Medium	Coarse	1A • Coastal	1B • Inland Coastal	2 • Transition	3 • Bay
	TRIAL SIDEWALK TREES (cont'd)																											
65.	Eucalyptus pauciflora Ghost Gum	●					●			●			●			●				●	●		●				●	●
66.	Jacaranda mimosifolia Jacaranda		●					●		●			●							●		●						●
67.	Koelreuteria bipinnata Chinese Flame Tree		●					●			●		●						●				●					●
68.	Koelreuteria paniculata Golden Rain Tree 'Fastigiata'		● ●				● ●				● ●		●		● ●				● ●				● ●					● ●
69.	Metrosideros kermadecensis	●				●					●						●			●		●	●			●	●	●
70.	Michelia doltsopa Michelia	●					●				●		●			●				●				●		●	●	●
71.	Nyssa sylvatica Sour Gum		●					●			●					●			●				●			●	●	●
72.	Platanus orientalis Oriental Plane		●					●			●			●							●			●		●	●	●
73.	Quercus coccinea Scarlet Oak		●						●	●						●	●			●			●	●				●
74.	Quillaja saponaria Soapbark Tree	●					●	●			●						●		●				●			●	●	●
75.	Rhaphiolepis 'Majestic Beauty'	●				●						●	●							●			●			●	●	●
76.	Robinia ambigua 'Idahoensis' 'Purple Robe'		● ●					● ●		● ●						● ●					● ●	● ●					● ●	● ●
77.	Robinia pseudoacacia Black Locust		●						●	●						●					●		●					●
78.	Sophora japonica Chinese Scholar Tree		●					●			●			●						●		●						●
79.	Sophora secundiflora Mescal Bean	●					●				●			●					●				●					●
80.	Tilia americana American Linden		●						●			●				●			●				●				●	●
81.	Tilia cordata Little-Leaf Linden		●					●				●						●	●				●			●	●	●
82.	Ulmus americana American Elm		●						●		●			●							●		●					●

Sun Exposure			Tolerances			Life of Tree		Outstanding Characteristics								Problems			Possible Sites								Comments	
Sun	Sun • Shade	Shade	Drought	Wind	Oak Root Fungus Resistant	20 to 40 years	Over 40 years	Aromatic	Attracts Birds	Fruit • Flower	Fall Color	Unusual Leaves	Clean • Neat	Bark	Silhouette	Sidewalk Damaging	Flower • Fruit Drop	Wind Intolerant	Neighborhood St.	Commercial Street	2nd Thoroughfare	Major Thoroughfare	Parkway	Lawn	Parking Lot • Plaza	Open Space • Park		
●	●						●							●										●		●	Prune erratic branching when young	65.
●					●	●				●		●					●	●	●		●	●		●		●	Use only in hot, sunny locations in Zone 3	66.
●			●	●		●				●	●	●					●		●	●	●			●	●		Stake and prune to develop high branching	67.
●			●	●		●				●	●	●					●		●	●	●			●			Gawky - prune to shape	68.
●			●	●		●									●				●				●					
●	●		●	●		●				●						●	●		●	●	●			●	●	●		69.
●	●					●		●		●							●	●	●	●				●	●		Needs rich soil, water	70.
●	●		●	●		●			●		●		●		●				●	●	●			●	●	●	Tolerates poor drainage	71.
●	●		●		●		●			●	●			●					●	●	●	●		●	●	●		72.
●							●				●	●							●		●	●	●	●	●	●		73.
●	●	●			●	●							●				●								●	●	Good hedge specimen	74.
●	●			●		●			●	●			●				●		●				●	●		●	Good container specimen; requires staking to develop tree form	75.
●			●		●	●		●		●						●	●		●						●	●	Use only in hot, sunny locations in Zone 3; spreads by suckers; needs root-control barrier	76.
●			●		●	●		●		●		●				●	●		●						●	●		
●			●			●		●		●						●	●										Wood is brittle; aggressive roots; often spreads by suckers	77.
●			●		●		●			●				●					●		●	●		●	●	●	Requires training to develop tree form	78.
●			●				●			●				●					●		●	●		●	●	●		79.
●				●			●			●												●		●	●	●		80.
●				●	●		●			●							●		●		●	●		●	●	●		81.
●			●				●				●					●	●										Under quarantine at present time	82.

SAN FRANCISCO TREE MATRIX

	Botanical Name / Common Name / 'Cultivated Variety'	Type of Tree				Height				Density			Shape						Growth Rate Per Year			Texture			Climatic Zone			
		Broadleaf Evergreen	Deciduous	Coniferous	Palm	Up to 15'	15' to 30'	30' to 50'	Over 50'	Open	Medium	Dense	Round	Spreading	Columnar	Oval	Upright	Pyramidal	6" Max • Slow	Moderate	1' Min • Rapid	Fine	Medium	Coarse	1A • Coastal	1B • Inland Coastal	2 • Transition	3 • Bay
	TRIAL SIDEWALK TREES (cont'd)																											
83.	Ulmus parvifolia Chinese Elm 'Drake'	●						●				●		●							●	●	●				●	●
		●						●				●		●							●	●	●				●	●
84.	Zelkova serrata Sawleaf Zelkova		●						●		●		●	●						●				●			●	●
	MEDIAN AND OFF-STREET TREES																											
85.	Acer rubrum Scarlet Maple		●					●			●					●					●			●			●	●
86.	Aesculus hippocastanum Horsechestnut 'Baumannii'		●						●			●				●								●				●
87.	Alnus rhombifolia White Alder		●						●			●				●					●			●		●	●	●
88.	Araucaria heterophylla Norfolk Island Pine			●					●									●		●		●				●	●	●
89.	Betula pendula European White Birch		●					●		●						●	●			●		●					●	●
90.	Casuarina stricta Mountain She-Oak	●						●		●			●							●		●			●	●	●	●
91.	Cedrus deodara Deodar Cedar			●					●			●						●		●		●						●
92.	Cinnamomum camphora Camphor Tree	●							●			●	●							●			●					●
93.	Crataegus phaenopyrum Washington Thorn		●				●			●			●							●			●				●	●
94.	Cryptomeria japonica Japanese Cryptomeria			●				●	●		●						●			●		●				●	●	●
95.	Cupressus macrocarpa Monterey Cypress			●				●			●			●							●	●			●	●	●	●
96.	Dodonaea viscosa Purple-Leaf Hopseed Tree 'Purpurea'	●				●						●	●								●		●			●	●	●
97.	Eucalyptus leucoxylon White Ironbark	●							●	●					●		●				●					●	●	●
98.	Eucalyptus polyanthemos Silver Dollar Gum	●						●			●			●		●					●		●			●	●	●

Sun Exposure: Sun	Sun Exposure: Sun • Shade	Sun Exposure: Shade	Tolerances: Drought	Tolerances: Wind	Tolerances: Oak Root Fungus Resistant	Life of Tree: 20 to 40 years	Life of Tree: Over 40 years	Outstanding Characteristics: Aromatic	Outstanding Characteristics: Attracts Birds	Outstanding Characteristics: Fruit • Flower	Outstanding Characteristics: Fall Color	Outstanding Characteristics: Unusual Leaves	Outstanding Characteristics: Clean • Neat	Outstanding Characteristics: Bark	Outstanding Characteristics: Silhouette	Problems: Sidewalk Damaging	Problems: Flower • Fruit Drop	Problems: Wind Intolerant	Possible Sites: Neighborhood St.	Possible Sites: Commercial Street	Possible Sites: 2nd Thoroughfare	Possible Sites: Major Thoroughfare	Possible Sites: Parkway	Possible Sites: Lawn	Possible Sites: Parking Lot • Plaza	Possible Sites: Open Space • Park	Comments	
●			●		●		●						●			●	●		●	●	●		●	●	●	●	Under quarantine at present time; susceptible to disease; requires considerable pruning; 'Drake' has weeping habit	83.
●			●				●						●			●	●		●	●	●		●	●	●	●		
●					●		●				●								●		●			●	●	●	Under quarantine at present time	84.
●	●						●				●																Needs moist soil	85.
●							●		●	●	●	●					●						●	●	●	●	Coarse dense foliage; needs summer watering	86.
●	●		●	●		●										●							●			●	Invasive roots are less troublesome if deep watered	87.
●	●		●				●					●			●								●	●		●	Good container specimen	88.
●	●					●								●	●								●	●		●		89.
●			●	●			●					●		●	●		●				●		●	●	●	●	Needs large space; tends to be messy	90.
●			●				●								●		●						●	●		●	Needs protection from winds	91.
●	●		●	●			●	●				●				●							●			●	Subject to verticillium wilt	92.
●			●		●	●			●	●	●						●							●		●	May be used on sidewalks if fruit drop is acceptable; susceptible to aphids, fireblight	93.
●	●	●			●		●							●	●									●		●	Prefers deep, moist soil	94.
●	●		●	●			●	●							●								●	●		●	Classic San Francisco tree	95.
●	●		●	●	●	●				●		●														●	Short-lived; requires training to develop tree form	96.
●				●		●		●		●														●		●		97.
●			●	●	●	●		●		●		●											●			●	Train when young	98.

SAN FRANCISCO TREE MATRIX

	Botanical Name / Common Name / 'Cultivated Variety'	Type of Tree				Height				Density			Shape						Growth Rate Per Year			Texture			Climatic Zone			
		Broadleaf Evergreen	Deciduous	Coniferous	Palm	Up to 15'	15' to 30'	30' to 50'	Over 50'	Open	Medium	Dense	Round	Spreading	Columnar	Oval	Upright	Pyramidal	6" Max • Slow	Moderate	1' Min • Rapid	Fine	Medium	Coarse	1A • Coastal	1B • Inland Coastal	2 • Transition	3 • Bay
	MEDIAN TREES (Cont'd)																											
99.	Eucalyptus sideroxylon Red Ironbark	●						●			●					●					●	●					●	●
100.	Fagus sylvatica Copper Beech		●						●			●						●			●		●					●
101.	Grevillea robusta Silk Oak	●							●		●							●			●		●				●	●
102.	Juglans hindsii California Black Walnut		●						●			●	●							●				●				●
103.	Leptospermum laevigatum Australian Tea Tree	●					●					●				●			●			●			●	●	●	●
104.	Lyonothamnus floribundus asplenifolius Fern-Leaf Catalina Ironwood	●						●			●					●				●		●				●	●	●
105.	Magnolia campbellii Campbell Magnolia		●						●	●			●						●					●			●	●
106.	Magnolia soulangiana Saucer Magnolia		●				●					●	●						●				●				●	●
107.	Malus 'Dolgo'		●				●			●				●						●		●	●				●	●
108.	Malus floribunda Japanese Flowering Crab-apple		●				●				●	●	●	●						●		●	●				●	●
109.	Malus ioensis Bechtel Crabapple 'Plena'		●				●				●						●			●			●				●	●
110.	Morus alba Stribling Fruitless Mulberry 'Stribling'		●				●				●		●								●			●				●
111.	Phoenix canariensis Canary Island Date Palm				●				●			●	●							●				●			●	●
112.	Pinus canariensis Canary Island Pine			●					●		●				●						●	●					●	●
113.	Pinus pinaster Maritime Pine			●					●		●			●							●	●			●	●	●	●
114.	Pinus pinea Italian Stone Pine			●					●			●	●						●				●			●	●	●
115.	Pinus radiata Monterey Pine			●					●		●		●								●		●			●	●	●

Sun Exposure			Tolerances			Life of Tree		Outstanding Characteristics								Problems			Possible Sites								Comments	
Sun	Sun • Shade	Shade	Drought	Wind	Oak Root Fungus Resistant	20 to 40 years	Over 40 years	Aromatic	Attracts Birds	Fruit • Flower	Fall Color	Unusual Leaves	Clean • Neat	Bark	Silhouette	Sidewalk Damaging	Flower • Fruit Drop	Wind Intolerant	Neighborhood St.	Commercial Street	2nd Thoroughfare	Major Thoroughfare	Parkway	Lawn	Parking Lot • Plaza	Open Space • Park		
			●	●		●			●	●		●		●		●	●									●	Susceptible to root rot; best planted in groves	99.
●							●				●			●		●							●		●	●	Beautiful foliage; protect from winds	100.
●	●		●		●	●				●							●						●	●		●	Brittle wood easily damaged in winds	101.
●			●		●		●		●	●		●					●						●	●		●	Native to Northern California	102.
●			●				●					●		●	●								●			●	Standards may be used on sidewalks	103.
●	●		●	●		●				●		●														●	Best planted in groves	104.
●	●						●			●						●								●		●	Requires a wind-protected area	105.
●	●	●					●			●			●		●		●	●					●	●		●		106.
●	●				●	●			●	●							●							●		●	Requires a wind-protected area	107.
●					●	●			●	●	●						●							●	●		Prune only to build framework and correct shape	108.
●					●	●			●	●	●						●							●	●	●	Susceptible to firebright, scale, aphids and spider mite	109.
●	●		●		●	●										●					●		●	●	●	●	Requires training when young	110.
●				●	●		●		●						●								●	●	●	●	Wide, heavy trunk; fronds drop easily in high winds	111.
●			●		●		●							●	●		●						●		●	●		112.
●			●	●			●																			●	Well adapted to sandy soil, coastal climate	113.
●	●		●	●			●								●								●	●		●		114.
●	●			●	●		●																●	●	●	●	Very fast growing; often shallow rooted	115.

SAN FRANCISCO TREE MATRIX

	Botanical Name / Common Name / 'Cultivated Variety'	Type of Tree				Height				Density			Shape						Growth Rate Per Year			Texture			Climatic Zone			
		Broadleaf Evergreen	Deciduous	Coniferous	Palm	Up to 15'	15' to 30'	30' to 50'	Over 50'	Open	Medium	Dense	Round	Spreading	Columnar	Oval	Upright	Pyramidal	6" Max • Slow	Moderate	1' Min • Rapid	Fine	Medium	Coarse	1A • Coastal	1B • Inland Coastal	2 • Transition	3 • Bay
	MEDIAN TREES (Cont'd)																											
116.	Pinus thunbergiana Japanese Black Pine			●				●			●			●						●		●	●			●	●	●
117.	Pinus torreyana Torrey Pine			●				●			●			●							●	●			●	●	●	●
118.	Pittosporum crassifolium Karo	●					●				●	●	●								●		●		●	●	●	●
119.	Pittosporum tenuifolium Tawhiwhi	●					●	●			●					●					●		●			●	●	●
120.	Podocarpus gracilior Fern Pine	●					●	●				●	●						●			●				●	●	●
121.	Populus nigra Lombary Poplar 'Italica'		●						●			●			●						●		●				●	●
122.	Prunus caroliniana Carolina Laurel Cherry	●						●			●						●			●			●			●	●	●
123.	Prunus cerasifera Cherry Plum 'Atropurpurea'		●				●				●		●							●			●			●	●	●
	'Krauter Vesuvius'		●				●				●		●							●			●			●	●	●
	'Thundercloud'		●				●				●		●							●			●			●	●	●
124.	Prunus lyonii Catalina Cherry	●						●			●					●				●			●			●	●	●
125.	Quercus agrifolia Coast Live Oak	●						●				●		●						●			●				●	●
126.	Quercus palustris Pin Oak		●						●	●			●							●			●				●	●
127.	Quercus rubra Red Oak		●						●			●	●	●							●			●			●	●
128.	Quercus suber Cork Oak	●						●			●		●						●					●			●	●
129.	Sequoia sempervirens Coast Redwood			●					●			●						●			●	●				●	●	●

Sun Exposure			Tolerances			Life of Tree		Outstanding Characteristics								Problems			Possible Sites								Comments	
Sun	Sun • Shade	Shade	Drought	Wind	Oak Root Fungus Resistant	20 to 40 years	Over 40 years	Aromatic	Attracts Birds	Fruit • Flower	Fall Color	Unusual Leaves	Clean • Neat	Bark	Silhouette	Sidewalk Damaging	Flower • Fruit Drop	Wind Intolerant	Neighborhood St.	Commercial Street	2nd Thoroughfare	Major Thoroughfare	Parkway	Lawn	Parking Lot • Plaza	Open Space • Park		
●			●	●			●								●								●		●	●	Accepts pruning or shearing	116.
●			●	●	●		●								●								●			●	Pruning tends to cause dieback	117.
●	●	●	●	●		●				●							●		●		●		●	●	●	●	Well-adapted to windy conditions	118.
●	●	●	●	●	●	●		●		●							●		●	●	●		●	●	●	●	Accepts shearing; susceptible to aphids	119.
●	●	●			●		●						●						●				●		●		Good container specimen; tolerates dense shade; tends to develop slowly	120.
●				●		●					●			●	●	●							●		●	●	Suckers profusely	121.
●	●		●		●	●				●							●		●	●	●			●	●	●	Flower and fruit drop a maintenance problem	122.
●					●	●				●		●					●		●		●			●	●	●	Susceptible to caterpillars and aphids; may be used on sidewalks if some fruit drop is acceptable; will grow in almost any soil	123.
●					●	●			●	●		●					●		●		●			●	●	●		
●					●	●			●			●					●							●		●		
●	●		●	●	●	●			●	●							●		●		●				●	●	Native to Southern California	124.
●							●								●									●	●	●	Needs considerable space; can be sheared into hedge	125.
●	●						●				●												●	●		●	Needs ample water and good drainage	126.
●			●				●				●												●	●		●	Needs ample water, fertile soil	127.
●			●	●			●							●	●		●	●	●		●	●			●	●	Protect from winds	128.
●	●				●		●	●						●				●					●	●		●	World's tallest tree; protect from winds	129.

ARTICLE 16

URBAN FORESTRY ORDINANCE

Sec. 800.	Title.
Sec. 801.	Purpose.
Sec. 802.	Definitions.
Sec. 803.	Jurisdiction.
Sec. 804.	Urban Forestry Division; Powers and Duties.
Sec. 805.	Tree Advisory Board; Establishment; Appointment; Powers and Duties.
Sec. 806.	Urban Forest Management Plan.
Sec. 807.	Planting and Removal of Street Trees—Permit Required; Appeals.
Sec. 808.	Protection of Trees and Landscape Material.
Sec. 809.	Routine Maintenance of Street Trees; Responsibilities of Property Owner.
Sec. 810.	Nuisance Trees; Abatement.
Sec. 811.	Landmark Trees.
Sec. 812.	Public Notice of Planting or Removal of Street Trees by the Division; Appeals to Director.
Sec. 813.	Penalties for Violation of Ordinance.
Sec. 813.1.	Enforcement of Ordinance; Designated Employees.
Sec. 814.	Procurement and Recycling of Plant Materials.
Sec. 815.	Severability.

SEC. 800. TITLE. This Ordinance shall be known as the San Francisco Urban Forestry Ordinance. (Added by Ord. 318-86, App. 8/5/86)

SEC. 801. PURPOSE. The San Francisco Urban Forestry Ordinance is enacted to further the following public purpose:

(a) To realize the optimum public benefits of trees on the City's streets, in public places, and on private property, including favorable modification of micro-climates, abatement of air and noise pollution, reduction of soil erosion and runoff, enhancement of the visual environment, and promotion of community pride;

(b) To integrate street planting and maintenance with other urban elements and amenities, including but not limited to utilities, vehicular and pedestrian traffic, and enhancement of views and solar access;

(c) To promote efficient, cost-effective management of the City's urban forest by coordinating public and private efforts within a comprehensive and professional management system;

(d) To reduce the public hazard, nuisance, and expense occasioned by improper tree selection, planting, and maintenance;

(e) To provide for the creation of an equitable, sustained, and reliable means of funding urban-forest management throughout the City;

(f) To create and maintain a unified urban-forest resource. enhancing the City's overall character and sense of place. (Added by Ord. 318-86, App. 8/5/86)

SEC. 802. DEFINITIONS. Unless the context specifically indicates otherwise,

(a) "City" shall mean the City and County of San Francisco.

(b) "Community Boards" of San Francisco shall mean the neighborhood mediation/dispute settlement service established under the auspices of The Community Board Program, Inc.

(c) "Department" shall mean the Department of Public Works of the City and County of San Francisco.

(d) "Director" shall mean the Director of the Department of Public Works of the City and County of San Francisco.

(e) "Injure" or "injury" shall mean any act which damages a tree, including but not limited to impact, cutting, carving, transplanting, or knocking over any tree on a public street or right-of-way, and as described in Section 808 of this Ordinance.

(f) "Landmark tree" shall mean a tree so designated pursuant to Section 811 of this ordinance.

(g) "Landscape material" shall mean any tree, shrub, ground cover or other plant.

(h) "Maintenance" shall mean pruning, mulching, clipping, watering, staking, spraying, propping, fertilizing, bracing, treating for disease or injury, and any other acts which promote the life, growth, health, or beauty of the City's trees.

(i) "Nuisance tree" shall mean any tree or portion thereof that poses a hazard to person or property. A tree may be deemed a nuisance if it or any part of it: (1) appears dead, dangerous, or likely to fall; (2) obstructs a street or sidewalk; (3) harbors a serious disease or infestation threatening the health of other trees; (4) interferes with vehicular or pedestrian traffic; or (5) poses any other significant hazard as set forth in regulations promulgated by the Director pursuant to this ordinance.

(j) "Person" shall mean any individual, firm, partnership, association, corporation, company, or organization of any kind.

(k) "Planting" shall mean putting or setting into the ground or into a container to grow.

(l) "Removal" shall mean any intentional or negligent act which causes a tree or landscape material to decline and/or die within a period of three years, including but not limited to damage inflicted upon the root system of a tree by the application of toxic substances, the operation of heavy machinery, the change of natural grade above or below the root system or around the trunk of a tree, excessive pruning, or the severing of part or all of the trunk.

(m) "Replacement value" shall mean the actual cost to the Department of replacing a tree or landscape material removed or destroyed, or if irreplaceable its value as determined pursuant to the valuation formula adopted by the International Society of Arboriculture, as amended from time to time.

(n) "Sidewalk" shall mean the area between the curb and the distant edge of the pedestrian walk-way.

(o) "Street" shall mean the vehicular travel-way portion of any public street, avenue, boulevard, lane, road, parkway, freeway, or other public way.

(p) "Tree" shall mean any large perennial plant having a woody trunk(s), branches, and leaves.

(q) "Tree Advisory Board" or "Tree Board" shall mean a board of private citizens to be appointed and to perform specific duties as set forth in Section 805 of this Ordinance.

(r) "Urban forest" shall mean all trees on lands within the borders of the City and County of San Francisco subject to the jurisdiction of the Department of Public Works.

(s) "Urban Forestry Division" or "Division" shall mean a Division within the Department of Public Works charged with the duty of carrying out the intent of this Ordinance. (Added by Ord. 318-86, App. 8/5/86)

SEC. 803. JURISDICTION. The Department shall have jurisdiction over the planning, planting, maintenance, and removal of all trees in any street or other public way as defined in Section 185 of this Code; over any landscape material in any street median, center strip, or other landscaped portion of a public right-of-way; over trees and other landscape material in other public spaces under the jurisdiction of the Department; and over certain trees on private property as designated in Sections 804(f) and 810 of this Ordinance. (Added by Ord. 318-86, App. 8/5/86)

SEC. 804. URBAN FORESTRY DIVISION; POWERS AND DUTIES. (a) **Assistant Superintendent for Urban Forestry.** The Division shall be directed by an Assistant Superintendent who shall meet Civil Service qualifications and should hold a degree in arboriculture, urban forestry, horticulture, or a closely related field, or have a minimum of five years' experience therein, as well as proven administrative skills. This Article does not authorize the creation of any new position or classification of positions under the Department of Public Works.

(b) **Arterial Planting Program.** The Division shall undertake a program of plantings of cohesive design along designated major traffic routes and commercial streets throughout the City.

(c) **Neighborhood Planting Program.** The Division shall encourage and support an active program of plantings within neighborhoods, such plantings to include the voluntary participation of neighborhood children and other residents to the fullest extent possible in both the planning and installation processes. Support may include, but need not be limited to, provision of trees, planting materials, sidewalk cutting and removal, planting labor, technical advice, and organizational assistance.

(d) **Major Maintenance of Street Trees—Responsibilities of Division; Responsibilities of Property Owners.** In a phased and orderly manner, the Division shall use its best efforts to inventory the condition and major-maintenance needs of all street trees in the City within three years of the enactment of this Ordinance and at least every five years thereafter. Maintenance practices shall be in accordance with species-specific standards issued by the Division. Major maintenance shall include, but need not be limited to: structural pruning as necessary to maintain public safety and to sustain the health, safety, and natural growth habit of the tree; routine adjustment and timely removal of stakes, ties, tree guards, and tree grates; watering sufficient to assure the establishment and survival of a tree; fertilizing as needed; pest- and disease-management procedures as needed and in a manner consistent with public health and ecological diversity; and replacement of missing or damaged trees.

The Division shall be responsible for the maintenance of street trees it has planted or for which the Division has assumed maintenance responsibility. A property owner shall be responsible for the maintenance of street trees he or she has planted or for which he or she has assumed maintenance responsibility through the purchase of real property or otherwise. Upon a finding by the Director or his designee that a street tree requires major maintenance or is being improperly maintained by the property owner, the Director shall notify the responsible party, perform the necessary work, and collect the costs of such work from the responsible party. The notice, billing and lien procedures shall be as prescribed for nuisance trees in Section 810 of this Ordinance.

(e) **Work Order Program for Trees on Public Property.** The Division may assume planting and maintenance responsibilities for trees and other landscape material on or fronting public properties when such work has been funded through work orders against the budgets of the various agencies and jurisdictions responsibile for the properties.

(F) **Review of Site Development Plans.** To assure compliance with the provisions of this Ordinance, and pursuant to Section 143 of the City Planning Code, the Division shall have the authority to review site-development-plan applications received by the Department's Central Permit Bureau that pertain to the planting, alteration, or removal of street trees. The Division shall also have the authority to review site-development-plan applications that pertain to the alteration or removal of landmark trees designated pursuant to Section 811 of this ordinance. Site plans must identify the location, specifiy the species and size of subject trees, and indicate any existing or proposed building or structure on the property that would require alteration or removal of such trees. Preliminary plans may be submitted for informal Division review prior to submission of a formal site-development-plan application. The Division may:

(1) Advise the Zoning Administrator within 30 days regarding the presence of landmark trees on the site and the impact of new construction on any such tree. The Division shall report its comments and recommendations to the Zoning Administrator for use in acting on the proposed permit application and regarding mechanisms to protect trees to be retained on a construction site against damage to trunk, roots, and branches. Final approval of the application by the Zoning Administrator, consistent with the provisions of Sections 808(c) and 811(c) hereof, shall constitute approval to plant, remove, or alter the specific tree.

(2) Advise the Zoning Administrator, as required, regarding planting of required street trees.

(3) Appear before the Planning Commission and other public forums, as necessary, to encourage the inclusion of sound urban forestry principles in the development of major planning or site-development proposals in the City.

(g) **Training Program for Division Staff.** The Division shall implement a comprehensive training program for its staff to ensure that the Division's planting and maintenance standards are implemented in an expert and consistent manner. All field personnel involved in tree maintenance and planting shall meet Civil Service qualifications, which should include certification in arboricultural knowledge and competency. The training program shall be administered by a qualified landscape professional, and shall include regular review, recertification, and advanced occupational training.

(h) **Public Education.** The Division shall undertake an on-going program of public outreach and education in order to promote public understanding of the City's urban forest and public adherence to the standards and procedures established under this Ordinance.

(i) **Tree Adoption Program.** The Division shall develop and implement a tree adoption program to honor individuals and organizations who donate money for the purpose of tree planting and maintenance. Money donated to the City and County for the purpose of tree planting and maintenance shall be deposited in the Adopt-a-Tree Fund established pursuant to this ordinance. (Added by Ord. 318-86, App. 8/5/86; amended by Ord. 183-88, App. 4/28/88)

SEC. 805. TREE ADVISORY BOARD; ESTABLISHMENT; APPOINTMENT; POWERS AND DUTIES. (a) There is hereby established an advisory board to be known as the Tree Advisory Board (hereafter the "Tree Board") consisting of 15 private citizens, at least five of whom shall be professionally trained and experienced in a tree-related field. All members of the Tree Board shall serve without compensation. The Tree Board members first appointed shall be the members presently serving on an interim board created by the Director, whose terms shall commence on the effective date of this Ordinance. Five of the members who are first appointed shall be designated by the Director to serve for terms of two years, five for three years, and five for four years. Thereafter, members shall be appointed by the Director for a term of four years, as follows: at least one member shall be selected from a list of persons nominated by the Director, one from a list nominated by the Mayor, and one from a list nominated by the Board of Supervisors. All of the vacancies occurring during a term shall be filled for the unexpired term in the same manner as appointments are made. The Assistant Superintendent of Urban Forestry shall serve as an ex-officio member of the Tree Board and a representative from the Recreation and Park Department, City Planning Department, and at the discretion of the Director, other City agencies shall also serve as ex-officio members.

(b) The Tree Board shall meet at least six times a year and shall establish its own operating procedures which, at a minimum, shall meet the public notice, meeting, voting, agenda and other procedural requirements imposed by Section 3.500 of the San Francisco Charter. The failure of a member to attend at least ½ of the regularly scheduled meetings of the Tree Board shall be grounds for removal from the Board by the Director. The Director shall secure a copy of the attendance list of all such meetings for the purpose of determining whether to remove a member for nonattendance.

(c) The Tree Board shall serve in an advisory capacity to the Director on matters relating to the implementation of this Ordinance and to tree management in the City, including appropriate funding mechanisms.

(d) The responsibilities of the Tree Board shall include but not be limited to the following:

(1) Advising the Director in a written report concerning the qualifications for the position of Assistant Superintendent for Urban Forestry;

(2) Studying the problems and determining the needs of the City concerning its street tree planting and maintenance programs, and advising the Director and working with the Division in this regard;

(3) Recommending to the Director appropriate species of trees to be planted upon City streets or other areas under the Department's jurisdiction;

(4) Working with the Community Boards of San Francisco in developing guidelines, standards, and procedures for the mediation of conflicts between property owners over the protection of views, solar access, planting/removal of trees, and other tree-related issues.

(5) Working with the Director concerning the development and implementation of an Urban Forestry Management Plan;

(6) Developing and recommending criteria for establishing "landmark" status for trees under the jurisdiction of the Department;

(7) Making recommendations to the Director concerning appeals of the Division's decisions on the planting or removal of trees, as set forth in Sections 807 and 812 of this Ordinance;

(8) Advising the Director concerning the implementation of this Ordinance; and

(9) Working in conjunction with the Director in disseminating to the public news and information concerning the selection, planting, and maintenance of trees throughout the City, and recommending from time to time to the Mayor and the Board of Supervisors desirable City tree programs and activities, including legislation and funding mechanisms. (Added by Ord. 318-86, App. 8/5/86)

SEC. 806. URBAN FOREST MANAGEMENT PLAN. Within three years of the adoption of this Ordinance, the Director with the advice and participation of the Tree Board shall adopt an Urban Forest Management Plan. The Division thereafter shall use its best efforts to insure that activities of the Division are guided by such plan. The plan shall incorporate the following elements:

(a) A clear, concise, and comprehensive Statement of Policies and Objectives for urban forestry management in the City, which statement is to be developed by the Director with the advice and participation of the Tree Board through a process of at least three public hearings;

(b) A designation of proposed urban forestry treatments for major traffic routes and districts within the City consistent with the City's Master Plan, together with a program, schedule, and suggested budget for implementing such treatments;

(c) An inventory of every street tree and any other trees deemed necessary by the Division, which inventory shall include, as appropriate, species, age, condition, maintenance records, names of adjacent property owners, record of fees and fines, and any other information necessary or usable in the long-range planning or day-to-day planting and maintenance of the City's urban forest;

(d) A Street-Tree Renewal Plan, based on an evaluation of species characteristics and performance as recorded in the inventory, providing for rotational reforestation of diseased or declining trees and break-up of potentially problematic monocultures;

(e) A set of Standards for the Division, and the public for street-tree installation, landscape-tree installation, pruning and maintenance, acceptable tree species and any other standards, criteria, or administrative procedures deemed necessary to carry out the purposes of this Ordinance and the Urban Forest Management Plan;

(f) A process for continual update and improvement of the Urban Forest Management Plan's elements. (Added by Ord. 318-86, App. 8/5/86)

SEC. 807. PLANTING AND REMOVAL OF STREET TREES—PERMIT REQUIRED; APPEALS. (a) **Permits.** It shall be unlawful for any person to plant or to remove a street tree without a valid permit for such work issued by the

(f) A process for continual update and improvement of the Urban Forest Management Plan's elements. (Added by Ord. 318-86, App. 8/5/86)

SEC. 807. PLANTING AND REMOVAL OF STREET TREES—PERMIT REQUIRED; APPEALS. (a) **Permits.** It shall be unlawful for any person to plant or to remove a street tree without a valid permit for such work issued by the Division. Any person who desires a permit shall apply to the Division on the designated form. The permittee shall post any permit to remove a tree on the affected tree immediately upon issuance.

(b) **Appeals.** Any affected party may appeal a permit decision of the Division to the Director within 10 days after issuance. The Director shall issue his written decision and order on the appeal after a public hearing and upon recommendation of the Tree Board. Appeals from a permit decision of the Director may be made within 15 days after issuance to the Board of Permit Appeals, whose decision on the matter shall be final. (Added by Ord. 318-86, App. 8/5/86; amended by Ord. 255-88, App. 6/22/88)

SEC. 808. PROTECTION OF TREES AND LANDSCAPE MATERIAL. (a) **Injury to or Destruction of Trees Prohibited; Injury Defined.** It shall be unlawful for any person to injure or destroy a tree on any City street or public property unless the City orders removal of the tree or removal is authorized by permit issued pursuant to Sections 804(f) or 807 of this Ordinance. "Injury" includes but is not limited to the following: injurious attachment of any rope, wire, nails, advertising posters, or other contrivance to any public tree as set forth in Section 675 and 675.1 of the Municipal Police Code; allowing any gaseous, liquid, or solid substance that is harmful to trees to come into contact with them; setting fire or permitting any fire to burn when such fire or the heat therefrom will injure any part of any tree.

(b) **Injury to or Destruction of Landscape Materials Prohibited.** It shall be unlawful for any person to injure or destroy any landscape material in any street median, center strip, or other publicly landscaped portion of a public right-of-way under the City's jurisdiction, except as authorized by the Department.

(c) **Construction Work; Protection of Trees Required.** It shall be unlawful for any person to engage in any construction work on private or public property without first taking steps to protect street trees from damage to trunk, branches or roots, or damage caused by soil compaction or contamination. All trees on any street or other publicly owned property near any excavation or construction of any building, structure, or street work shall be adequately protected in accordance with guidelines established by the Assistant Superintendent of Urban Forestry, including but not limited to preservation of the trunk, bark, leaves, scaffold branches, and immediate soil. Removal of the street tree is authorized only by permit obtained pursuant to Section 804(f) or Section 807 of this Ordinance. (Added by Ord. 318-86, App. 8/5/86)

SEC. 809. ROUTINE MAINTENANCE OF STREET TREES; RESPONSIBILITIES OF PROPERTY OWNER. Property owners shall be responsible for the routine maintenance of all street trees fronting their properties,

whether or not planted by the Department, including watering and weed control as needed, removal of tree-well trash, and reporting to the Division in a timely manner any damage to or condition of the tree which may be hazardous to the health of the tree or of the public. The Division shall devise and apply a systematic program for advising property owners of their maintenance responsibilities. (Added by Ord. 318-86, App. 8/5/86)

SEC. 810. NUISANCE TREES; ABATEMENT. (a) **Notice to Property Owner(s).** Upon a finding by the Director that a tree on private property or a street tree for which a property owner is responsibile is a "nuisance tree" as defined herein, the Director shall mail a written ntoice to the property owner(s) which describes the condition creating the nuisance, and sets forth the actions required to be taken to abate the nuisance and the date by which compliance must be completed. Required action may include replacement or removal of the tree. In cases of extreme danger, as determined by the Director, the Director may require immediate compliance.

(b) **Performance of Work by Division; Costs Billed to Property Owner.** If the responsible property owner(s) does not take the action required by the Director to abate the nuisance tree within the prescribed time, the Division may perform the necessary work and the cost of this service (including labor, equipment, materials, inspection services, and administrative overhead) shall be billed to the property owner(s). Payment shall be due within 60 days of the mailing date of the notice of payment due.

(c) **Contents of Notice of Payment Due.** The notice of payment due sent to the responsible property owner(s) shall contain the following information:

(1) A statement of the date written notice was sent as required by subsection (a) above;

(2) A statement of the work performed by the Division, the date or dates on which such work was performed, and the costs incurred by the Division in performing the work;

(3) A notice advising the responsible property owner(s) that he or she is liable for the costs in the amount listed in the notice and that payment to the City to reimburse these costs is due within 60 days of the mailing date of the notice;

(4) A notice advising that a penalty of 10 percent plus interest at the rate of one percent per month on the outstanding balance shall be added to the costs from the date that payment is due; and

(5) A notice advising the responsible property owner(s) that if payment of the costs is not received within 90 days of the due date, a lien may be imposed on the property pursuant to the provisions of this Section.

(d) **Nonpayment of Costs; Additional Request.** If full payment of the costs is not received within 60 days after notice of payment due was sent pursuant to Subsection (c) above, an additional request for payment shall be sent to the responsible property owner(s). The notice shall state that the property owner(s) is liable for the payment of the costs indicated on the notice and if payment of such costs is not received within 30 days of the mailing date of this notice, a lien may be imposed on the property pursuant to the provisions of this Section.

(e) **Lien Proceedings; Notice.** If payment is not received within 30 days following mailing of the additional request, the Director shall initiate special assessment lien proceedings pursuant to the provisions of Article XX, Chapter 10 of the San Francisco Administrative Code, by reporting the delinquency to the Board of Supervisors. The entire unpaid balance of the costs, including the penalty on the unpaid balance, shall be made a special assessment lien against the responsible property owner(s) property. Such charges against delinquent accounts shall be reported to the Board at least once a year. The Director shall also indicate which of such delinquent accounts should be exempted from the lien procedure because of the small amounts involved, or because another procedure is more appropriate. (Added by Ord. 318-86, App. 8/5/86)

SEC. 811. LANDMARK TREES. (a) **Designation.** With the advice of the Tree Board and following a public hearing, the Director shall adopt criteria for the designation of landmark trees, which criteria shall include consideration of the age, size, shape, species, location, historical association, visual quality, or other contribution to the City's character. Upon the recommendation of the Director, the Board of Supervisors may designate as a "landmark tree" any tree on property under the jurisdiction of the Department meeting the criteria adopted by the Director, or may rescind such designations.

(b) **Removal; Special Permit Required.** Landmark trees shall be removed only upon a determination of the Director, following a public hearing and upon recommendation of the Tree Board, that the removal is necessary for the safe or reasonable use of property. The Director shall issue criteria governing such determinations.

(c) **Removal; Director Authorized to Require Compensation.** If the Director determines that removal of a landmark tree is necessary, he may impose such reasonable conditions on the permit for removal as he deems necessary to compensate the public for the loss of the tree, including but not limited to replacement of the tree and/or contribution to the Division's revolving fund for replacing and planting trees. (Added by Ord. 318-86, App. 3/18/86)

SEC. 812. PUBLIC NOTICE OF PLANTING OR REMOVAL OF STREET TREES BY THE DIVISION; APPEALS TO DIRECTOR. (a) **Division Planting Project.** When the Division determines to plant trees in any sidewalk area of the City, not less than 14 days prior to commencement of the work the Director shall cause to be posted at conspicuous locations along the street notices describing the work to be done. A copy of such notice shall also be mailed to the Tree Board and to each property owner within a radius of 300 feet of the area(s) to be planted. The notices shall depict the identifying mark used by the Division to indicate on the sidewalk the exact location of each proposed tree. Any objections to the proposed work must be submitted within 10 days after posting to the Director, who shall where feasible modify the landscaping plan to accommodate any objections without adversely affecting the overall landscaping plan. The Director's decision on the matter shall be final.

(b) **Removal of Tree By Division.** Except in the case of manifest danger and immediate necessity, as determined by the Director, no street tree shall be cut down or removed by the Division unless 21 days' prior written notice is given to the owner of the tree or of the fronting property, or his or her agent, and to the Tree Board. In addition, 21 days prior to the removal date, the Division shall post a notice on the tree and in conspicuous locations along the street within one lineal block of the tree. If, within 10 days after the giving of such notice, the owner or his or her agent or a member of the public files with the Division his or her written objections to the removal, the division shall not cut down or remove the tree until the objecting party receives a hearing before the Director. Written notice of the date, time and place of the hearing shall be sent to both the objecting party and to the tree Board not less than 10 days prior thereto. The Director shall also forward a copy of the written objections to the Tree Board. The Director shall issue his or her written decision and order on the appeal after a public hearing and upon recommendatin of the Tree Board. The Director's decision on the matter shall be final.

(c) **Notices.** Written notices required to be given by this ordinance shall be given by personal delivery or by mailing, either by letter or postal card, postage prepaid, to the last known address as the same appears on the City's most recent assessment rolls. (Added by Ord. 318-86, App. 8/5/86)

SEC. 813. PENALTIES FOR VIOLATION OF ORDINANCE. (a) Violation of any of the provisions of this Ordinance shall be chargeable as an infraction or a misdemeanor. Every violation determined to be an infraction is punishable by a fine not exceeding $100 for a first violation, $200 for a second violation within one year, and $500 for each additional violation within one year. Every violation determined to be a misdemeanor is punishable by a fine not exceeding $1,000 for each offense.

(b) In addition to the penalty set forth in Subsection (a) above, any person who removes, damages, or destroys a tree in violation of the provisions of this Article shall pay a sum of money equal to either the cost of its replacement or the diminishment in its value. Any and all amounts paid or collected pursuant to this subsection shall be deposited into a revolving fund to be used by the Division for replacing and planting trees. (Added by Ord. 318-86, App. 8/5/86)

SEC. 813.1. ENFORCEMENT OF ORDINANCE; DESIGNATED EMPLOYEES. The classes of employees of the City and County of San Francisco hereinbelow set forth shall have the duty of enforcing the provisions of this Ordinance relating to trees, including, but not limited to, their unauthorized planting and removal, their injury and destruction, and their maintenance.

Classification No.	Class Title
3418	Gardener Assistant Supervisor
3422	Park Section Supervisor
3436	Tree Topper Supervisor I
3440	Landscaping and Street Planting Supervisor
5170	Superintendent, Street Cleaning/Urban Forestry
5173	Assistant Superintendent, Street Cleaning and Planting

(Added by Ord. 355-87, App. 8/27/87)

SEC. 814. PROCUREMENT AND RECYCLING OF PLANT MATERIALS. (a) **Contract Nurseries/Growing.** In accordance with City purchasing procedures, the Department may establish purchase agreements at commercial nurseries.

(b) **Department of Public Works Nursery.** To assure availability of trees of proper species, size, quality, and acclimatization, the Department may grow and maintain, so far as is feasible, adequate stocks of street and landscape trees within the Department of Public Works' nursery or nurseries to supply planting activities on public properties and rights-of-way.

(c) **Stockpiling.** To capture economies of scale, the Department may purchase planting materials in large quantities for use in any planting project on public property and rights-of-way.

(d) **Recycling.** To the greatest extent economically feasible, the Department shall establish means to recycle the plant trimmings, clippings, cuttings, and other waste generated by its activities and, if economically viable, that generated by other public and private landscape work in the City. Recycled materials not used in the City's own programs may be marketed to other public entities and the general public as compost, soil amendment, mulch, wood chips, wood rounds, firewood, fuel or other salable products. Any funds generated from this effort shall be deposited into a special fund for the Division's planting programs. (Added by Ord. 318-86, App. 8/5/86)

SEC. 815. SEVERABILITY. If any section, subsection, subdivision, paragraph, sentence, clause or phrase of this Article or any part thereof is for any reason held to be invalid or ineffective by any court of competent jurisdiction, such decision shall not affect the validity or effectiveness of the remaining portions of this Article or any part thereof. The Board of Supervisors hereby declares that it would have passed each Section, subsection, subdivision, paragraph, sentence, clause or phrase thereof irrespective of the fact that any one or more sections, subsections, subdivisions, paragraphs, sentences, clauses or phrases be declared invalid or ineffective. (Added by Ord. 318-86, App. 8/5/86)

ARTICLE 16.1

TREE DISPUTE RESOLUTION

Sec. 820. Title.
Sec. 821. Purpose.
Sec. 822. Definitions.
Sec. 823. Procedures.
Sec. 824. Standards for Resolution of Disputes.
Sec. 825. Apportionment of Costs.
Sec. 826. Liabilities.
Sec. 827. Enforcement.
Sec. 828. Application With Other Laws.
Sec. 829. Severability.

SEC. 820. TITLE. This ordinance shall be known as the San Francisco Tree Dispute Resolution Ordinance. (Added by Ord. 445-88, App. 9/28/88)

SEC. 821. PURPOSES. (a) The San Francisco Tree Dispute Resolution Ordinance is enacted for the following public purposes:

(1) To create rights in favor of private property owners relating to the restoration of sunlight or views lost due to tree growth and to create a procedure for the resolution of disputes concerning those rights;

(2) To promote all feasible means of energy conservation and all feasible uses of alternative energy supply sources;

(3) To encourage the use of solar energy for heat and light, encourage food production in private gardens, and increase access to light and views of surrounding locale;

(4) To preserve and promote the aesthetic and practical benefits which trees provide for individuals and the entire community; and

(5) To discourage ill-considered harm to, or destruction of, trees.

(b) This ordinance shall not be read to impair obligations imposed by an existing easement or a valid pre-existing enforceable covenant or agreement.

(c) Nothing in this ordinance is meant to replace the peaceful, sensible, and just resolution of differences between neighbors acting in good faith.

(d) It is not a purpose of this ordinance to facilitate or encounter the transmission of radio or television signals. (Added by Ord. 445-88, App. 9/28/88)

SEC. 822. DEFINITIONS. For the purposes of this ordinance, the following definitions shall apply:

(a) "Community Boards of San Francisco" shall mean the neighborhood mediation/dispute settlement service established under the auspices of the Community Board Program, Inc.

(b) "Complaining party" shall mean any property owner who wishes to alter or remove a tree on the property of another which creates an obstruction to his or her access to sunlight or view.

(c) "Obstruction" shall mean any view or access to sunlight which is blocked or diminished by the growth, maintenance or location of a tree.

(d) "Restorative action" shall mean any specific requirement to resolve a tree dispute.

(e) "Solar access" shall mean the availability of sunlight to a property.

(f) "Thinning" shall mean the selective removal of entire branches from a tree so as to improve visibility through the tree and/or improve the tree's structural condition.

(g) "Topping" shall mean elimination of the upper portion of a tree's trunk or main leader.

(h) "Tree" shall mean any woody perennial plant, usually with one or more major trunks attaining a height of at least fifteen feet at maturity; as used in this ordinance, the singular shall include the plural and the plural shall include the singular.

(i) "Tree arbitrator" shall mean any trained and experienced arbitrator acceptable to both complaining party and tree owner to mediate or arbitrate a tree dispute.

(j) "Tree claim" shall mean the written basis for arbitration or court action under the provisions of this Article which includes the following:

(1) The nature and extent of the alleged obstruction, including pertinent and corroborating physical evidence. Evidence may include, but is not limited to, photographic prints, negatives, or slides. Such evidence must show absence of the obstruction at any documentable time during the tenure of the complaining party. Evidence to show the date of acquisition must be included.

(2) The location of all trees alleged to cause the obstruction, the address of the property upon which the trees are located, and the present tree owner's name and address.

(3) Any mitigating actions proposed by the parties involved to resolve the tree claim.

(4) The failure of personal communication between the complaining party and the tree owner to resolve the alleged obstruction as set forth in Section 823(a) of this Article. The complaining party must provide physical evidence that written attempts at reconciliation have been made and failed. Evidence may include, but is not limited to, copies of and receipts for certified or registered mail correspondence.

(k) "Tree owner" shall mean any individual owning real property in San Francisco upon whose land is located a tree alleged by a complaining party to cause an obstruction.

(l) "Tree removal" shall mean the elimination of any tree from its present location.

(m) "Trimming" shall mean the selective removal of portions of branches from a tree so as to modify the tree's shape or profile or alter the tree's appearance.

(n) "Views" shall mean a distant vista or panoramic range of sight of San Francisco, neighboring areas, or the San Francisco Bay. Views include but are not limited to skylines, bridges, distant cities, geologic features, hillside terrains, and wooded canyons or ridges. (Added by Ord. 445-88, App. 9/28/88)

SEC. 823. PROCEDURES. The procedures described in this Section shall be followed in the resolution of tree disputes between private parties.

(a) Initial Reconciliation. A complaining party who believes in good faith that the growth, maintenance or location of a tree on the private property of a tree

owner diminishes the beneficial use or economic value of his or her property because the tree interferes with the access to sunlight or views naturally accruing to the property, shall notify the tree owner in writing of these concerns. The notification should, if possible, be accompanied by personal discussions to enable the complaining party and tree owner to attempt to reach a mutually agreeable solution.

(b) Community Board Mediation. If the initial reconciliation attempt fails, the complaining party may propose mediation with the Community Boards of San Francisco as a means to settle the dispute on a relatively informal basis. Acceptance of mediation by the tree owner shall be voluntary. Parties should be encouraged to give notice to immediate neighbors and solicit input. The Community Board mediator should consider the objectives, benefits and burdens set forth in this Article in attempting to help both parties reach a resolution of the dispute.

(c) Tree Claim Preparation. In the event that the initial reconciliation process fails and Community Board mediation either is not elected or fails, the complaining party must prepare a tree claim as defined in Section 822(j), and provide a copy to the tree owner in order to pursue either binding arbitration or litigation. This process constitutes the filing of a tree claim.

(d) Binding Arbitration. In those cases where the initial reconciliation process fails and where Community Board mediation has not resolved the dispute, the complaining party must offer to submit the dispute to binding arbitration, and the tree owner may elect binding arbitration. The identity of the tree arbitrator shall be agreed upon by both the complaining party and the tree owner who shall indicate such agreement in writing. This agreement may provide for employment of experts representing the parties or may be limited to an investigation of the tree claim conducted by the tree arbitrator. The tree arbitrator shall follow the provisions of this Article to reach a fair resolution of the tree claim and shall submit a complete written report to the complaining party and the tree owner. This report shall include the tree arbitrator's findings with respect to all standards listed in Section 824 and a pertinent list of all mandated restorative actions with any appropriate conditions concerning such actions including a schedule by which mandates must be completed. Such actions must be completed with due regard for the health of the tree.

(e) Litigation. In those cases where initial reconciliation fails and binding arbitration is not elected, civil action may be pursued by the complaining party for resolution of the sunlight access or view tree claim under the provisions of this ordinance. The litigant must state in the complaint that arbitration was offered and not accepted. (Added by Ord. 445-88, App. 9/28/88)

SEC. 824. STANDARDS FOR RESOLUTION OF DISPUTES. In resolving the tree dispute, the tree arbitrator or court shall consider the benefits and burdens derived from the alleged obstruction within the framework of the purposes of this Article as set forth in Section 821 in determining what restorative actions, if any, are appropriate. In proposing any given restorative action the complaining party shall have the burden of proving that the burdens posed by the tree owner's trees outweigh the benefits provided by the trees with respect to the proposed restorative action.

(a) Burdens.

(1) The hazard posed by a tree to persons or structures on the property of the complaining party including, but not limited to, fire danger and the danger of falling limbs or trees.

(2) The extent to which the tree diminishes the amount of sunlight available to the garden or home of the complaining party.

(3) The extent to which the tree interferes with efficient operation of a complaining party's pre-existing solar energy system.

(4) The existence of landmarks, vistas or other unique features which cannot be seen because of growth of trees since the acquisition of the property.

(5) The extent to which the alleged obstruction interferes with sunlight or view. The degree of obstruction shall be determined by means of a measuring instrument or photography.

(6) The extent to which solar access or the view is diminished by factors other than trees.

(7) Deleterious effect of the tree upon the complaining party's vegetation through loss of heat and light except that the dropping of leaves or maintenance factors shall not be a burden under this ordinance.

(b) Benefits.

(1) Visual quality of the tree, including but not limited to, species characteristics, size, growth, form and vigor.

(2) Location with respect to overall appearance, design, and/or use of the tree owner's property.

(3) Soil stability provided by the tree considering soil structure, degree of slope, and extent of the tree's root system.

(4) Visual, auditory and wind screening provided by the tree to the tree owner and to neighbors.

(5) Energy conservation and/or climate control provided by the tree.

(6) Wildlife habitat provided by the tree.

(7) The economic value of the tree as measured by criteria developed by the International Society of Arborculture and the economic value of the property as a result of the tree.

(8) Other tree-related factors, including, but not limited to:

(i) The degree to which the species is native to the local region or area;

(ii) Indigenous nature of the species to which the tree belongs;

(iii) Specimen tree quality;

(iv) Rare tree species, and the frequency of new planting of a tree;

(v) Landmark tree designation, as determined pursuant to Section 811 of the Public Works Code.

(c) Restorative Actions.

(1) Restorative actions may include written directions as to appropriate timing of trimming, thinning, topping, or removal. Such restorative actions are to apply only to current parties to the agreement. The tree arbitrator or court may require compensation to the tree owner for value lost due to restorative actions.

Possible restorative actions may include (i) no action, (ii) trimming, (iii) thinning, (iv) delayed trimming or thinning, (v) topping, or (vi) tree removal with possible replacement plantings.

(2) Restorative actions shall be limited to the trimming and/or thinning of

branches where possible and practical. Trimming or thinning may be on a delayed basis, providing time for the top of the tree to grow above the point where it obstructs sunlight or view.

(3) When trimming and/or thinning of branches is not a feasible solution, the impact on the health of the tree shall be considered before topping is required.

(4) In those cases where tree removal eliminates or significantly reduces the tree owner's benefits, required replacement plantings shall at the tree owner's option be set forth in writing prior to the tree removal. The tree owner may elect tree removal with replacement plantings (as an alternative to trimming, thinning and topping).

(5) All trimming, thinning, topping and tree removal required under this ordinance may be performed by a person or firm selected by the tree owner with the concurrence of the complaining party, except that in the event that the complaining party is not obligated to bear any of the cost for such action, his or her concurrence is not required. The use of a certified arborist for such work is especially encouraged; in the case of Landmark trees, use of a certified arborist is required.

(6) The extent of solar access or view available and documentable as present at any time during the tenure of the complaining party is the limit of restorative action which may be required.

(7) No restorative action may be required concerning any tree the base of which is more than 300 feet from the immediate vicinity of the dwelling of the complaining party's property. If no dwelling exists, the distance shall be determined from the most likely dwelling site upon the property or from the geographical center of the property at the discretion of the arbitrator or court as appropriate.

(8) A tree which has been the subject of restorative action under the terms of this ordinance is exempted from other property owners' claims for a period of five years from date of filing of a tree claim. (Added by Ord. 445-88, App. 9/28/88)

SEC. 825. APPORTIONMENT OF COSTS. (a) Cost of Arbitration. The complaining party and the tree owner shall each pay 50 percent of the costs of the arbitrator's personal fee, if any.

(b) Costs of Litigation. The complaining party shall pay 100 percent of both parties' reasonable attorneys' fees in the event that his or her claim is finally denied, or no action is ordered pursuant to Section 824(c). In all other cases the complaining party and the tree owner shall each pay his or her attorney's fees. Court costs shall be allocated to the parties at the court's discretion.

(c) Costs of Restorative Actions. At any time during the procedure specified in this ordinance the parties may agree between themselves as to the allocation of the costs of restorative action. If such an agreement is not reached, the following shall apply:

(1) As to trees planted prior to the effective date of this ordinance the complaining party shall pay 100 percent of the costs of the initial restorative action. The complaining party shall pay the cost of subsequent restorative action as a result of the recurrence of the same obstruction.

(2) As to trees planted subsequent to the effective date of this chapter the tree owner and the complaining party shall each be responsible for 50 percent of the

costs of restorative action and subsequent recurrence of the same obstruction. (Added by Ord. 445-88, App. 9/28/88)

SEC. 826. LIABILITIES. (a) The issuance of Community Board mediation findings, an arbitration report or a court decision shall not create any liability of the City with regard to the restorative actions to be performed.

(b) The complaining party shall indemnify and hold harmless the tree owner with respect to any damages or liability incurred by said owner arising out of the performance of any work at the behest of the complaining party as follows:

(1) With respect to trees planted prior to the effective date of this ordinance, the complaining party shall indemnify the tree owner as to 100 percent of any such damages or liability.

(2) With respect to trees planted after the effective date of the ordinance, the complaining party shall indemnify the tree owner as to 50 percent of any such damages or liability.

(c) Failure to enforce on the part of the city will not give rise to any civil or criminal liabilities. (Added by Ord. 445-88, App. 9/28/88)

SEC. 827. ENFORCEMENT. A violation of this Article is not a misdemeanor, and the enforcement of this Article shall be by private parties involved. The complaining party shall have the right to bring injunctive action to enforce any restorative action ordered pursuant to this Article. (Added by Ord. 445-88, App. 9/28/88)

SEC. 828. APPLICATION WITH OTHER LAWS. Nothing in this ordinance shall be construed to affect, diminish, or replace the duties and authority of the Director of Public Works set forth in Article 16 of the Public Works Code. (Added by Ord. 445-88, App. 9/28/88)

SEC. 829. SEVERABILITY. If any portion of this ordinance or its application to any person or circumstances is held invalid, the remainder of the ordinance, including its application to other persons or circumstances shall remain in effect. (Added by Ord. 445-88, App. 9/28/88)

SECTION 1007

PLANTING

1007.01 GENERAL. - The work covered under this Section is considered specialty work and the Contractor must have a California License in Class C-27 or he must employ as a sub-contractor a person or persons holding such license. Only experienced landscape Contractors shall handle, plant, trim, prune or water nursery stock.

As set forth in Section 105.01, the Contractor shall keep himself informed of and shall comply with the laws and regulations applicable to the work, particularly those laws related to the transportation and shipment of plants and materials. Certification of inspection of nursery stock shall be provided as required by Federal, State and local laws.

Planting shall be done only during weather that is favorable for the particular type of planting operation and plant involved. The Contractor shall supply at his sole expense all water hose and other equipment as required to properly maintain the nursery stock for the duration of the contract. Names, quantities and sizes of plants shall be as set forth in the Plant list on the drawing.

The Contractor shall prepare the site for planting by:

A) clearing the areas of weeds, roots, debris, rocks and underground obstructions to an acceptable planting depth prior to placing imported material and/or prepared backfill mix;

B) treating the soil with a selective pre-emergence herbicide, so as to eliminate weeds or other undesirable plants;

C) providing proper moisture for optimum planting conditions;

D) cultivating, raking and rolling areas before planting.

The Contractor shall furnish and install all plants and materials, including imported soils, herbicide fertilizers, stakes, ties, straps and other accessories not called out but required to complete the work as intended.

1007.02 SOIL STERILIZATION. - Application of a soil sterilizing, or selective pre-emergence herbicide agent to the area or material shall be in strict accordance with the recommendations of the manufacturer. The Contractor, by instituting all precautions necessitated by the type of chemical agent and its application, shall prevent any contact of the agent occasioned by wind or otherwise with persons or animals or with existing planting on private property or otherwise not specifically intended to be destroyed. Any such planting destroyed or damaged shall be replaced at the sole expense of the Contractor with healthy planting of the type and at the stage of growth identical to that being replaced. Soil sterilizer or weed killer shall be an approved type which will permit planting and not inhibit normal growth of the nursery stock planted three weeks after application. Compounds containing cyanide or arsenic will not be acceptable.

1007.03 IMPORTED SOIL. - The Contractor shall furnish and place imported soil in the planting areas indicated on the plans. The soil to be imported shall conform to the following standards:

1. Particle size distribution;
   Minimum ninety-five percent passing a 25.4 mm screen; minimum eighty-five percent passing a 9.5 mm screen; fraction passing a 9.5 mm screen shall contain a minimum of fifteen percent, and a maximum of forty percent total silt and clay.
2. Agricultural suitability;
   Salinity (EC X10) less than 4.0 at twenty-five degrees Centigrade; Sodium absorption ratio (SAR) less than ten; Boron in saturation extract less than 1.0 ppm; pH (soil reaction) 6.0-7.5
3. Pests;
   The population of any single species of plant pathogenic nematode less than five hundred per pint of soil.

The Contractor shall make the site of his soil source known to the Engineer two weeks minimum prior to the date he proposes to do hauling and placing of soil. The Engineer will inspect the site, collect samples of the soil, and deliver the samples to an accredited soils laboratory for analysis and report. The Contractor shall pay all costs for the required analysis and reports. Upon receipt of the analysis and report from the laboratory indicating compliance with the standards set forth in the Specifications, the Engineer will notify the Contractor that he may proceed with the importation of soil. No importation of soil shall be done prior to notification to the Contractor by the Engineer. Only approved soil shall be used for the entire project and substitutes will not be acceptable.

Imported soil shall be delivered to the site in a reasonably dry and workable condition; it shall not be muddy or wet. Imported soil shall be placed and spread to the lines and grades shown on the plans and as directed by the Engineer. Any extraneous or unacceptable materials not previously removed shall be raked off and removed from the site at the time of spreading. Imported soil shall be compacted to a uniform specified depth as shown on the plans or directed by the Engineer.

The character of the imported soil shall conform to the character of the existing soil so that the final product in:

a) Lawn areas shall be a coarse, sandy loam with optimum drainage characteristics. The soil type in lawn areas shall be free of imported soil amendments. Optimum imported soil types shall include; Banks sand, Dillon Beach, Orly #2, Presidio Shoal or Lapis.

b) Ground cover, shrub or areas other than lawn areas shall be a coarse sandy loam with optimum drainage characteristics similar to the types listed above with a ten to twenty-five percent addition of soil amendment.

1007.04 SOIL AMENDMENT. - Soil amendment shall be fresh raw fir or pine bark and consist of ninety-nine percent (99%) bark and less than one percent (1%) wood; fine grind, one-eighth (1/8) inch to zero (0) particle size, contain a minimum of ninety-two percent (92%) organic matter on a dry weight basis with a dry bulk density of 450-580 lbs. per cubic yard. Salinity shall not measure over 4.0 millimhos per centimeter at 25 degrees centigrade as measured by saturation. It shall be

stabilized with 0.8-1.2% nitrogen, 0.08% iron and a non toxic biodegradable wetting agent.

Samples of soil amendment and source of supply shall be submitted to the Engineer for testing and approval prior to delivery to the site. Only approved amendment and source of supply shall be utilized, and no substitutions will be accepted.

1007.05 PREPARED SOIL. - Prepared soil or backfill mix shall consist of, by volume, two thirds imported soil and one third soil amendment. The prepared soil shall be mixed on the site and no more shall be mixed than can be used in one day. It shall be thoroughly mixed and turned over four times minimum with a shovel to assure a good mixture.

1007.06 FERTILIZERS. - Commercial fertilizers shall be pelleted in form and shall be of the following formula: six percent nitrogen, nine percent phosphoric acid, and six percent potash. Fertilizer planting tablets shall be composed of slow release fertilizers compressed into tablets of twenty one gram weight and specifically designed for root zone placement. They shall be of the following formula: twenty percent nitrogen, ten percent phosphoric acid, and five percent potash. All fertilizers shall be brought to the job site in the manufacturer's unopened containers and shall carry labels stating manufacturer's name, fertilizer weight and assurance that analysis has been made.

1007.07 NURSERY STOCK. - Nursery stock shall be first class, representative of the normal species or variety, equal to, or exceeding the standards of the American Association of Nurserymen and applicable Federal and State Codes and of the size and caliber specified on the plans or in the Special Provisions. Only fresh, vigorous, healthy, full, bushy, not leggy, well-rooted, branched, shaped and established nursery stock, free from insects, disease, disfiguring knots, sun scald injuries, bark abrasions, or other disfigurements shall be furnished. Plants that become wilted anytime before planting will not be considered acceptable.

The soil level in fifteen gallon and larger containers shall not be lower than four inches below the top of the container, three inches below the top of the container for the five gallon size, and two inches below the top of the container for the one gallon size. Ground cover plants shall be grown in flats and will be inspected at the nursery by the Engineer, and shall be delivered to the job site in the flats in which they were grown.

Nursery stock nomenclature is based on the American Joint Committee on Horticultural Nomenclature, or on names generally accepted in the nursery trade. Each plant shall be well formed, undamaged, not root bound and shall not have a deformed root system.

In fifteen gallon containers, each tree trunk shall not have any limbs over one quarter inch in diameter from ground level to a height of six feet. Such limbs shall be removed as directed by the Engineer. However, light growth along the tree trunk is desirable. Each tree shall have a dominant leader, untrimmed, unbroken and trained to a vertical position. Any tree having a weak crotch will be rejected. Due to plants' varied growing habits, any exceptions to the standards set forth here shall be approved by the Engineer prior to accepting any plants.

The Engineer will attach a tag to each tree, shrub and container of ground cover accepted for planting. Any plant not tagged will be considered as a reject and shall not be planted. At time of planting, a plant which has been tagged yet shows signs of neglect will be rejected. Each and every variety of nursery stock shall be identified by its botanical name, specie and variety printed on a hardwood tag which shall be fastened to the trunk of the tree, shrub or to the flat of ground cover. Identification tags shall be fastened to every tree and to twenty percent of the shrubs in each grouping of each variety throughout the project. Ground cover shall have one tag for each flat of each variety.

The Contractor shall notify the Engineer forty-eight hours in advance of the time the nursery stock is to be received at the site. All nursery stock shall be available for inspection at a nursery located within fifty measured road miles from San Francisco's City Hall. If not available within this area, all additional expenses for transportation, board and lodging resulting from the Engineer's inspection shall be borne by the Contractor.

1007.08 PLANTING PROCEDURES FOR PLANTS IN CONTAINERS. - Planting pits for plants supplied in containers shall conform to the following minimum standards; a one gallon container shall be twelve inches wider and six inches deeper than the container size; a five gallon container shall be sixteen inches wider and nine inches deeper than the container size, and a fifteen gallon container shall be twenty four inches wider and twelve inches deeper than the container size. The soil in the planting pits shall be of optimum moisture content at the time of planting. Excessively wet or dry soil as well as unfavorable weather conditions shall be considered unacceptable transplanting conditions.

All containers shall be cut with tin snips or approved can cutters. An axe shall not be used.

When planting, the root balls shall be handled carefully so that they do not crack or fall apart. The Engineer may require light slashing of the sides and/or a criss-cross across the bottom of the root ball to sever exposed roots growing in a circular manner.

All planting pits shall be backfilled with "prepared soil" as specified in Section 1007.05.

In planting, the plant root ball shall be placed high enough in the pit so that after due natural settling the top of the root ball soil is not more than one inch below the surface of the surrounding adjacent ground. This will be checked specifically during the premaintenance inspection. Adjustments shall be made by the Contractor to achieve the Specified positioning.

After the root ball is in position, more "prepared soil" shall be added and hand-tamped into place to bring the back fill up to grade.

When the backfill is approximately in place, fertilizer tablets shall be placed alongside and around the root ball according to the following schedule:

1 Gallon plant	:	3 tablets
5 Gallon plant	:	5 tablets
15 Gallon plant	:	6 tablets
24 Inch Box	:	8 tablets
36 Inch Box	:	10 tablets
48 Inch Box	:	12 tablets
54 Inch Box	:	14 tablets

After planting, the Contractor shall build a six-inch high berm around the root ball forming a basin to facilitate watering. The berms shall be maintained throughout the planting and maintenance periods. No berms are required in grass areas.

All plants shall be watered immediately after planting.

Trees shall be staked and tied immediately after planting.

1007.09 TREE STAKING. - Each tree shall be staked at the time of planting using stakes, tree straps and nails.

Each tree shall be double staked with two cross braces and two ties minimum. Cross bracing material shall be made of redwood or douglas fir construction grade wood with dimensions of one inch by three inches by the distance between the two stakes.

The position of the cross braces shall be determined for each tree according to the height and branching structure of the tree.

Stakes shall be positioned so as to miss the root ball completely. Stakes shall be made of douglas fir or redwood construction grade or lodgepole pine wood with dimensions of two inches by two inches by twelve feet long. Stakes shall be hardwood pointed at one end and treated after being pointed with copper napthanate which shall penetrate the stake to a minimum of one-quarter inch depth. Four feet of the stake shall lie below grade level.

Each tree shall be secured to the cross braces using two straps (minimum) in a figure-eight tie. Tree ties shall be made of a durable corded rubber and of sufficient length so that they are semi-loose with approximately one-quarter inch clearance between the tree trunk and the strap.

The straps shall be secured to the braces by nailing with eleven-gauge galvanized roofing nails placed at the center of the brace.

1007.10 GUYING. - Guying material shall consist of zinc coated number ten BWG guy wire connected with galvanizing turnbuckles, one per line. Plastic ribbon tie one inch wide with a minimum tensile strength of five hundred pounds shall be used to connect guy wire to tree branch.

A deadman stake two inches by four inches by two feet long or a three-quarter inch diameter by three feet long steel pipe shall be used to hold each guy wire in place.

One-half inch polyethylene tubing painted white shall be used to cover guy wire.

For twenty-four inch and thirty-six inch boxes, a minimum of three guy wires shall be used. For forty-eight inch boxes and fifty-four inch boxes a minimum of four guy wires shall be used for safety.

1007.11 GROUND COVER. - Ground cover nursery stock and lawn and the planting thereof shall be in accordance with the applicable requirements of Section 1007.08.

Ground cover shall not be planted in an area until all trees and shrubs for that particular area have been planted and all surplus material removed.

Spacing of ground cover nursery stock shall be as indicated on the plans or specified in the Special Provisions.

Ice Plant (Mesembryanthemu Edule) cuttings shall be planted one to a hole, or at one-foot centers, in rows one foot apart ground measurement. Plants in adjacent rows shall be staggered.

1007.12 SEQUENCE OF PLANTING FOR GROUND COVER NURSERY STOCK. - Planting pits shall be excavated to the proper size and depth to accommodate root systems without cramping.

Each plant shall be centered in the pit in a plumb position, regardless of the slope of the ground.

The pit shall be backfilled with native soil material unless otherwise specified.

The soil shall be carefully tamped around the plant, taking care not to bruise the plant.

The area planted with ground cover plants shall be watered immediately after planting.

The soils shall be cultivated to a uniform grade between plants and commercial fertilizer shall be applied on the ground surface over the entire area at a rate of fifteen pounds per one-thousand square feet.

1007.13 GRASS SEED. - Each variety of seed shall be packed separately, delivered in good condition and clearly tagged as required by law showing the variety, purity, germination and weed content. The seed shall be delivered as specified and must be guaranteed to be as stated on the tags.

The following mixture of grass seed shall be used unless otherwise stated in the Special Provisions, the plans or as directed by the Engineer:

Name of Seed	Percent of Mix
Perennial Rye	
Yorktown 2	25%
Manhattan	25%
Hybrid Blue Grass	
A-24	30%
Baron	20%

1007.14 GRASS SEED SAMPLING AND TESTING. - Determination of purity shall be made separately for each type of seed in the mixture. A minus tolerance of two-tenths of one percent in the specified purity of each type of seed will be allowed.

The following tolerances in germination will be allowed:

96 or over.....5
90 or over, but less than 96.....6
80 or over, but less than 90.....7
70 or over, but less than 80.....8
60 or over, but less than 70.....9
Less than 60.....10

The Engineer will take a representative sample of each type of seed, seal the container and forward the sample to the State Department of Agriculture Seed Testing Division. The samples will be tested for purity, germination and weed content. The seals on the seed containers shall not be broken until the Engineer consents to same in writing. The Engineer may condemn any seed on which the seal has been broken prior to the time he consents to this action.

If the seed sample does not pass the specifications as determined by the tests made by the State Department of Agriculture, the Contractor shall immediately remove from the work the seed which did not meet specifications.

If it is in the City's best interest, the Engineer may allow the seed to be sampled and tested by an approved private laboratory but all fees and expenses connected therewith shall be paid by the Contractor.

1007.15 LAWN PLANTING. - After the area is to receive lawn has been graded and cultivated, it shall be disced and cross-disced in two directions or rototilled, thoroughly pulverizing the surface.

Fertilizer shall be applied to indicated turf areas at a rate equal to one pound of actual nitrogen per one thousand square feet. Fertilizers shall be applied by mechanical rotary or drop soil to a depth of three inches. Areas inaccessible to power equipment shall be fertilized with hand tools and incorporated into the soil. The Contractor shall restore prepared areas to the specified condition prior to seeding if eroded, settled, or otherwise disturbed after fine grading.

Only skilled workmen will be allowed to sow the seed. The surface shall be raked lightly and the seed sown evenly by a mechanical seeder at the rate of one pound per one hundred square feet. Sowing shall be done only in calm weather and in the presence of the Engineer.

After the seed has been sown, the surface of the soil shall be raked very lightly, so that the germination is even throughout. After raking, the surface shall be rolled with a light roller to achieve an even surface free of humps and surface irregularities to facilitate mowing.

Immediately after completion of planting, the seeded area shall be watered with a fine spray to provide a one-inch depth of penetration into the soil. The top surface shall not be allowed to dry out at any time.

1007.16 LAWN SOD. - Lawn sod shall be at least ten months old and have a well developed root system firmly knitted together. The sod shall be free from weeds and shall be treated with a lawn moth control agent. Sod shall be delivered in one foot wide strips, five feet long and one and one-half inches thick. Sod shall be as specified in the Special Provisions or on the plans.

1007.17 LAWN SOD PLANTING. - Preparation for lawn sod planting shall be similar to that as required for lawn planting in Section 1007.15.

The Contractor shall lay sod to form a solid mass with tightly fitted joints. Ends and sides of sod strips shall be butted together and edges shall not be overlayed. Strips shall be staggered to offset joints in adjacent courses. All excess sod shall be removed to avoid smothering of adjacent grass. The top of the sod pad shall be flush with adjacent curbs, sidewalks, drains and seeded areas.

Sod shall not be installed on saturated soil. The initial row of sod shall be installed in a straight line beginning at the bottom of slopes, perpendicular to the direction of the sloped areas. Subsequent rows shall be placed parallel to and tightly against previously installed rows.

Sod placed on slopes greater than three to one shall be pegged to prevent slippage. Place two stakes per yard of sod.

Sod shall be thoroughly watered with a fine spray immediately after laying. Sod shall be rolled with a light lawn roller to ensure contact with subgrade.

1007.18 STREET TREE AND MEDIAN PLANTING. - All street tree and median planting shall be performed in accordance with the requirements of Section 1007.08, except as hereinafter specified. The Engineer shall be notified forty-eight hours prior to planting. In street tree planting, the tree's root ball shall be flush with the bottom edge of the bricks or precast covers in the sidewalk areas.

All plantings in center islands having an irrigation system, in areas not requiring slope stabilization or in removed sections of the sidewalk, shall be planted without basins or berms around the pits and shall not be mulched.

1007.19 CUTTING CONCRETE AND ASPHALT PAVEMENTS. - Concrete and asphalt sidewalk and island pavement shall be cut along the edge of each tree pit with a concrete cutting saw, as specified in Section 701.03, to a depth of two inches to isolate the section of concrete or asphalt to be removed and to leave a clean-cut edge on the remaining sidewalk or pavement. Edges shall be cut parallel and perpendicular to the curb and shall be squared and true except for pits in traffic islands which shall be aligned as directed by the Engineer.

1007.20 BRICKS OR PRECAST COVERS SET ON SAND. - Bricks or precast covers set on a sand bed shall not be placed until the last days of the "Plant Establishment Period." The prepared backfill in the tree pits shall have settled and present a firm bed, as determined by the Engineer, before placing the sand bed. Bricks shall be burned solid clay masonry units, standard building bricks, brick-red colored, smooth-faced texture and shall conform to the requirements for Grade MW of ASTM "Standard Specifications for Building Brick (Solid Masonry Units from Clay or Shale)," Designation C62.

Prepared backfill in planting pits shall be regraded to receive the bricks or precast cover on the sand bed. The Contractor shall make certain that backfill is firmly packed under adjacent sidewalk and pavement and shall hand-tamp fill material under adjacent sidewalk and pavement if necessary at the same time the sand bed is placed. A two inch layer of clear river sand shall be placed over the prepared backfill to form a firm setting bed for the bricks or precast cover. The top surface of the bricks or precast cover shall be flush with the adjacent pavement surface.

After the bricks have been placed and full-joint mortared, clean sand shall be placed around the tree to about one-half inch below the surface of the bricks and the bricks shall be brushed clean. Any bricks that within a one year period tip, rock or settle, shall be removed and reset to finished grade in accordance with Section 105.10.

1007.21 TREE GUARDS. - Except for conifers, all trees planted in paved areas shall have a tree guard constructed of three-quarter mesh, sixteen gauge, four feet wide galvanized wire cloth, placed immediately around the tree. Each guard shall be securely fastened top and bottom to the inner side of the tree stakes with three, three-quarter inch galvanized staples. The guard shall be positioned with the joint at the inside of the stakes so that passers-by will not get snagged. The bottom edge of the tree guards shall be a maximum of eighteen inches above the adjacent grade.

1007.22 PAYMENT. - Imported soil satisfactorily furnished and placed as specified shall be paid for as specified in the Special Provisions. When imported soil is specified to be paid for at the price bid per unit volume, the depth to be used in computing the volume shall be the depth measured normal to the slope of the natural grade with compacted soil in place, multiplied by the area measured along the surface of the finished grade. When imported soil is specified to be paid for at the price bid per unit area, the area shall be measured along the surface of the finished grade.

SECTION 1008

MAINTENANCE AND PLANT ESTABLISHMENT

1008.01 GENERAL. - The Contractor, from the time of planting, shall maintain all nursery stock and other planting planted under the contract, shall do all work to establish the satisfactory growth of such planted nursery stock and other planting, shall maintain the entire of the areas landscaped under the contract, shall continue such maintenance throughout the "Plant Establishment Period", and shall do all related and Incidental Work.

Maintenance shall include replacing any planted nursery stock or other planting which fails to establish normal healthy growth, as determined by the Engineer. Replacement with healthy stock shall be made immediately upon withering or failure to grow, or within forty-eight hours after notification by the Engineer; in addition, any replacements which fail to grow satisfactorily, as determined by the Engineer, shall be satisfactorily replaced by the Contractor; all at no additional cost to the City.

Maintenance shall also include keeping the landscaped areas free of weeds, rocks, debris and other deleterious material; maintaining and keeping plant irrigation basins and saucers properly formed; cultivating; restoring ground areas damaged by erosion or trespassing; doing all necessary watering including furnishing water and equipment for the use thereof; and doing all other work necessary, or required, for the satisfactory establishment of normal healthy growth of the planted nursery stock or other planting.

1008.02 INSPECTION. - After planting, the site will be periodically inspected by the Engineer. Should the Contractor, after written notification by the Engineer of any deficiency in the maintenance or necessity for replacement of plants, fail to remedy such deficiency or make such replacement, the Engineer may cause such deficiency to be remedied or replacement made and the cost thereof deducted from moneys due the Contractor. Should the best interest of the City require immediate remedy without the delay incident to such notification, remedial action, as necessary to alleviate the emergency will be taken and the cost thereof deducted from moneys due the Contractor.

1008.03 PRE-MAINTENANCE INSPECTION AND APPROVAL. - The Contractor shall notify the Engineer in writing, at least one week prior to the completion of all planting and related work that all plant material,

will at the time stated, be satisfactorily in place, weed free, and in satisfactory condition.

The Engineer will schedule and make arrangements for the planting inspection. Approval of the planting at this inspection signifies that the planting has been satisfactorily completed and the "Plant Establishment Period" may commence.

If the inspection reveals deficiencies in the planting, the Engineer will give the Contractor a list of deficiencies to be corrected by the Contractor before the "Plant Establishment Period" may commence.

If the inspection reveals deficiencies in the planting, the Engineer will give the Contractor a list of deficiencies to be corrected by the Contractor before the "Plant Establishment Period" may begin. The Contractor shall correct the deficiencies, request a second inspection to verify that the corrections have been made, and if so verified, the Engineer will notify the Contractor to begin the "Plant Establishment Period." If deficiencies still exist, the procedure shall be repeated and the beginning of the "Plant Establishment Period" shall be delayed until all noted deficiencies have been corrected.

1008.04 PLANT ESTABLISHMENT WORK. - The "Plant Establishment Period" shall be a period of continuous satisfactory maintenance, the duration of which shall be as specified in the Special Provisions.

The "Plant Establishment Period" shall commence on the date designated by the Engineer after satisfactory completion and approval of the planting and related work.

Weeding shall be done periodically, often enough to prevent weeds from growing to two inches in height.

Weed control by chemical treatment will be permitted, but the Contractor shall be responsible for any damage to adjacent plants by the use thereof. The use of mowers and scythes will not be allowed.

Sand in planting pits for trees planted in sidewalk areas shall be replenished every thirty days prior to final inspection.

Irrigation basins shall be reformed and remulched prior to final inspection.

Additional work, in the judgment of the Engineer necessary for proper plant establishment, shall be done as Incidental Work. Examples of such work are: wind guards for trees and shrubs, stakes for shrubs, additional protective fencing, and drainage ditches.

Planting shall be replaced as necessary in accordance with the requirements of Section 1008.01. In addition, replacement trees and shrubs planted during the "Plant Establishment Period" shall each be clearly identified by a large, white, wooden tag attached thereto, showing the date of planting.

Plants, replacing those previously planted and not observed for the full "Plant Establishment Period", which, after acceptance of the work, fail to establish normal healthy growth shall be considered to be defects in the work, and subject to the requirements of Section 105.10.

1008.05 TREE AND SHRUB MAINTENANCE. - Maintenance of trees and shrubs, and plant establishment work therefor, shall be in accordance with the applicable requirements of Sections 1000 and 1008.

Any plants that have settled so that the top of the root ball is below the bottom of the basin or finished grade, as applicable, shall be raised to the specified level. All plants that have settled deeper than as

specified immediately hereinbefore, and have failed to grow, shall be removed and replaced by the Contractor at his sole expense.

1008.06 GROUND COVER NURSERY STOCK MAINTENANCE. - Midway in the "Plant Establishment Period", fifteen pounds of commercial fertilizer shall be applied per 1000-square feet of ground cover area.

Nursery stock shall be watered sufficiently to keep the ground moist well below the root system, throughout the life of the contract.

1008.07 LAWN MAINTENANCE. - Areas planted with lawn shall be watered sufficiently to keep the area uniformly moist throughout the life of the contract.

The lawn shall be mowed and trimmed when the grass reaches a height of two inches, after which the area shall be satisfactorily rolled. After initial mowing, the lawn shall be mowed once a week.

All bare spots on the lawn shall be reseeded.

The lawn shall be maintained for the duration of the "Plant Establishment Period" at the end of which time the lawn shall be mowed, weeded, and trimmed for final inspection.

1008.08 SOD MAINTENANCE. - While the grass is growing the Contractor shall keep the lawn free from weeds and disease. Either chemical weeding, hand weeding, or both may be used to maintain healthy lawn growth. The grass shall be cut as many times as required to keep the height of the grass below two inches. No cut grass shall be allowed to lay on the turf. Any bare spots shall be filled with sod to fit. No seeding will be allowed.

1008.09 CULTIVATING. - The area between plants shall be kept cultivated and shall have been cultivated within seven days prior to the pre-maintenance inspection and within seven days prior to the final acceptance inspection.

1008.10 FINAL ACCEPTANCE INSPECTION AND APPROVAL. - At least one week in advance of the expiration of the "Plant Establishment Period" the Contractor shall request the Engineer to schedule a final acceptance inspection.

The inspection will be similar to the pre-maintenance inspection. If any deficiencies are noted by the Engineer at the final inspection, the "Plant Establishment Period" will be extended until such deficiencies are satisfactorily corrected. The Contractor shall bear all costs required to maintain the plantings during the extended "Plant Establishment Period" and if the time allowed for completion of the job is exceeded, will be liable for liquidated damages.

AGENCIES AND ORGANIZATIONS

The following agencies and organizations are actively involved in the management of San Francisco's Urban Forest:

Department of Public Works, Division of Urban Forestry
2323 Army Street
San Francisco, CA 94124
(415) 695-2162

Citizens' Tree Advisory Board
(Contact the Division of Urban Forestry to leave a message for the Tree Board.)
Monthly meetings are open to the public and held on the second Thursday of each month at 5:00 PM at:
Library, Administration Building
Southeast Sewage Treatment Plant
750 Phelps Street
San Francisco, CA 94124

Recreation and Park Department, Urban Forestry
McLaren Lodge, Golden Gate Park
San Francisco, CA 94107
(415) 753-7042

Friends of the Urban Forest
512 Second Street
San Francisco, CA 94107
(415) 543-5000

San Francisco League of Urban Gardeners
2540 Newhall Street
San Francisco, CA 94124
(415) 468-0111

Department of City Planning
450 McAllister Street
San Francisco, CA 94102
(415) 558-6264

San Francisco Unified School District
Landscape Division
834 Toland Street
San Francisco, CA 94124
(415) 695-2329

California ReLeaf
The Trust for Public Land
116 New Montgomery St., 3rd floor
San Francisco, CA 94105
(415) 495-5660

REFERENCE MATERIALS

Cotton, Lin and McNair, James; Trees for San Francisco; San Fran cisco: Friends of the Urban Forest, 1985.

Harris, Richard; Arboriculture: The Care of Trees, Shrubs and Vines in the Landscape; Englewood Cliffs, NJ: Prentice Hall, Inc, 1983.

Sunset Magazine; Western Garden Book; Menlo Park, CA: Lane Publishing Co., 1988.

DEMONSTRATION TREE PLANTING

Various trees recommended in The Trees of San Francisco are planted along Park Presidio Avenue between Fulton and Lake Streets. They are identified by species and intended to add to the public's knowledge about trees and aid in tree selection.

OTHER INFORMATION

The following materials may be obtained from the Department of Public Works, Division of Urban Forestry, (415) 695-2162:

1. Permit application forms for street tree planting or removal
2. District description excerpts from The Trees of San Francisco
3. List of species recommendations for specific locations/ microclimates
4. Urban Forestry Ordinance
5. Tree Dispute Resolution
6. Adopt-a-Tree Resolution

BIBLIOGRAPHY

Adams, Gerald D. "The cities that are The City", San Francisco Examiner 7 April 1987, pp. A-13 through A-18.

Alexander, Christopher, et al. A Pattern Language. New York, New York: Oxford University Press, 1977.

Beatty, Russell. Trees for Lafayette. Oakland, California: ASLA, Northern California Chapter Publications Group, 1975.

City and County of San Francisco, Department of City Planning, San Francisco Master Plan.

City of Palo Alto Tree Advisory Task Force. The Palo Alto Street Tree Management Plan, 1983.

Cottin, Lin and McNair, James. Trees for San Francisco. San Francisco, California: San Francisco Friends of the Urban Forest, 1983.

Gilliam, Harold. Weather of the San Francisco Bay Region. Berkeley: University of California Press, 1962.

Harris, Richard. Arboriculture: The Care of Trees, Shrubs and Vines in the Landscape. Englewood Cliffs, New Jersey, 1983.

Kelly, Alden. Tree Value Appraisal. Fullerton, California, 1989.

Sunset. Western Garden Book. Menlo Park, California: Lane Publishing Company, 1989.

Kraftner, Johann. "The tree and architecture", 31 Lotus International. Venice, Italy: Gruppo Editoriale Electa S.p.A., 1981.

TreePeople. a planters' guide to the urban forest. Los Angeles, California: TreePeople, 1983.

Urban Trees Design Group. Green Streets. Oakland, California: City of Oakland, 1981.

Wolfe Mason Associates. City of Thousand Oaks Forestry Master Plan. 1989.

Tree Advisory Board

Larry Costello
Drew Detsch
Brian Fewer
Clifford Janoff
Elizabeth McClintock
Harold Retler
Bob Sena
Susie Schoaf
Stephen Shotland
Dick Turner
Isabel Wade

Department of Public Works, Division of Urban Forestry

Susan Albrecht
Melvin Baker
Carrie Durkee
Jim McGee
Dan McKenna

D.P.W., Bur. of Engineering, Landscape Architectural Section

John Thomas, Project Manager
Rebecca Enns
Bobbi Feyerabend
Connie Goldade
Edward Janelli
Jackie Johnson
Bonnie Ng
Kate Read
Katherine Selle

Reprographic Services

Dori Friend
David German
Malcolm Kimberlin
Jessie's Graphics
Blue Print Service